

THE ENCYCLOPÆDIA AND DICTIONARY OF EDUCATION

A COMPREHENSIVE, PRACTICAL AND AUTHORITATIVE GUIDE ON ALL
MATTERS CONNECTED WITH EDUCATION, INCLUDING EDUCATIONAL
PRINCIPLES AND PRACTICE, VARIOUS TYPES OF TEACHING INSTITU-
TIONS, AND EDUCATIONAL SYSTEMS THROUGHOUT THE WORLD

EDITED BY
PROFESSOR FOSTER WATSON
M.A., D.LITT.

EMERITUS PROFESSOR IN THE UNIVERSITY COLLEGE OF WALES, ABERYSTWYTH,
AND GRESHAM LECTURER IN RHETORIC ; MEMBER OF COUNCIL OF THE TEACHERS'
GUILD OF GREAT BRITAIN AND IRELAND ; HON. MEMBER OF THE MAINE HISTORICAL
SOCIETY, U.S.A. ; CORRESPONDING MEMBER TO THE HISPANIC SOCIETY OF
AMERICA, AND CORRESPONDING MEMBER OF THE *Real Academia de Buenas Letras*
de Barcelona.

WITH ARTICLES BY ABOUT NINE HUNDRED
EMINENT AUTHORITIES



IN FOUR VOLUMES
VOLUME I

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PREFACE

A COMPREHENSIVE ENCYCLOPAEDIA OF EDUCATION has been a *desideratum* for many years. The Education Act of 1902 was the culmination of a long struggle for national elementary education. In the whole period from the time of the Industrial Revolution of the latter half of the eighteenth century onwards, with constantly increasing vision, men and women came to realize the close connection of the educational with all the social movements of the times, and the multitudinous significance of education in the development of the national life. Two kinds of investigators into education gave themselves up ungrudgingly to educational problems in the latter part of the nineteenth century—those who concerned themselves with the educational problems of elementary schools for the children of the people, or, as we may call it, the quantitative side of education; and the other class of inquirers who were rather devoted to the question: What would education be at its best, in all its stages; or the qualitative side. The former class was much the more numerous, for it included statesmen and politicians, social reformers and philanthropists, ministers of religion, enthusiastic elementary teachers, and hard-headed and high-souled working men. Numerous societies had been formed, such as the Society for Bettering the Condition of the Poor, the Sunday School Union, the British and Foreign School Society, the National School Society, and later, the Birmingham League, the National Education Union, the Welsh Education Alliance. Movements like the Society for the Promotion of Christian Knowledge were strengthened. But most vital were organizations like the Moral Force Chartists, expanding into a National Union of the Working Classes, and the Christian Socialist movement of Maurice and Kingsley, with its Working Men's College. All these and many other movements consolidated the inner demand, founded upon thought-out grounds, of the underlying unity of education and social progress.

The other class of educationists came from amongst the best teachers themselves. They were of the prophetic type, Joseph Payne, Thring, Quick, Widgery, Bowen, Storr, Ebenezer Cooke, C. H. Lake, F. C. Turner, and with them psychologists such as Alexander Bainmen, who believed that educational principles must be developed by intellectual concentration, and concurrently with direct and constant reference to school practice and experience. They formed Teachers' Societies, and particularly the old Education Society, which, in the latter part of the nineteenth century, pioneered or developed by encouragement all that philosophical or educational enterprise could offer for consideration. They were the precursors of what University Professors in Education might become, whose scope includes educational research, experiment, and above all, the wide outlook on all the best that has been thought and practised and suggested in education, together with the distributive task of handing on the most helpful and stimulative thought to each generation of teachers in training.

There has been common ground between these two types of educationists

—those specially interested in education in its ameliorative socializing function in the nation, and those who have specially endeavoured to seek out the connection between the highest ethical and intellectual ends of mankind at its best—and the educational possibilities of transfiguring the schools with the highest humanist aims, in teaching-spirit, in teaching-methods, and in school-working generally.

Educational Libraries

But the subject matter of education has grown so complex, so intertwined in various points of view within itself and in many other departments of thought that whoever begins to think on education soon finds himself led on from topic to topic, in endless vistas, so that it becomes hopeless to get together all the subjects for educational thought, without recourse to an indefinitely large number of authorities on the ever-increasing array of subject matter, which for one reason or other, comes into the scope of "Education." Thus, perhaps the most palpable objective permanent result of the old Education Society may be said to be the educational library, especially rich in old and rare education books, now housed in the Teachers' Guild of Great Britain and Ireland, collected with indomitable energy and enthusiasm by Mr. R. H. Quick. The Library of the Board of Education, of course, has special facilities in its collection of contemporary educational literature, especially of reports of Commissions, special inquiries, and documentary statistics of international and colonial, as well as of national, education. It is remarkable how the prominent publicists of the latter half of the nineteenth century made excellent private collections (within certain limits) of books on education. It was, of course, necessary for the man of affairs to form more or less of a library for himself, since very few Public Libraries had good collections—at any rate, so arranged that the books required for reference on educational subjects could be got at, as wanted; for they were often distributed over a great number of separate volumes, classified not under education, but under all sorts of other subject-headings and distributed over distantly-arranged shelves.

Thus, educationists have, individually, been obliged to accumulate their own libraries. But, besides the expense of this process, which is now (in the expansion of educational interests and subjects) possible only for persons of considerable means, reference is a matter of time, in hunting out the right volumes and passages. It is in education, as a subject of study, as in geography. A geographical library may contain thousands of books of discoveries and adventures, travels, reports, statistics and theoretical and other treatises on the subject, but it needs also a gazetteer. We need, and have long needed, an educational gazetteer of wide information, in other words an Encyclopaedia of Education, which shall be comprehensive in topics, often giving the general information wanted on a specific point, and what is also extremely important, indications where further information may be sought most effectively. The subject of education has developed so enormously even within the last twenty years, that those who were in full touch with School Boards and popular education in the latter part of the nineteenth century are to-day far from being familiar with later developments. An encyclopaedia is not only a gazetteer of types of schools and movements; it must include also, within certain limits, so to say, a series of descriptive maps, of theory, practice, methods, organization, and administration of

education. Moreover, education requires more than a statement of the educational life and thought of the present, though that has been almost in the world of knowledge an *imperium in imperio*. It embodies a multitude of noble traditions derived from the life-experience of the past.

An Encyclopaedia a Library on a small scale

It is true that an encyclopaedia is, in appearance, and to some extent, actually, a comprehensive repository of facts, a happy hunting-ground for references, and a delightful hope of security in supplying the gaps of individual knowledge. Mr. Ainger's historical suggestion of editorial direction to the contributors to the Dictionary of National Biography, "No flowers by request," applies to all encyclopaedias. Yet the experienced teacher and reader on education knows that it is impossible to let himself loose in the garden of education, without finding himself animated in the great educational, humanist, and scientific traditions, by the unconscious rousing of a stimulus which by no means ends in the reading of concise tablets of bare description, as attached by the gardeners, but not necessarily obscuring the fact of the beauty of the flowers, though so succinctly describing the details. Once secure of identification, and the flower in our hands or within sight, its attraction may be left to speak for itself.

An Encyclopaedia of Education, however, should be more than a mere collection of topics and details. It is a vast domain of modern civilization, into which a teacher wanders, as if coming into his own. It is a guide-book on a large scale, it is true, but it also contains the outline of the great inheritance, the tradition from the past and tradition in the making in the present, the guarantees of the hope for the future of the nation.

It is the first time, in our country, that so distinguished, so representative and so numerous a company of educational writers has been associated in the production of so comprehensive an Encyclopaedia of Education. It is, we trust, no vain hope that in such an associated effort of so many acknowledged leaders and thinkers, so widely different in special interests, yet so intent in the common cause of what each takes to be sound, that the present encyclopaedia will stand for and, in its measure, strengthen that sense of unity which has been so unmistakably typified in the English Annual Conferences of Educational Associations (at the beginning of each year), which bring together, for separate and for conjoint discussion, nearly forty associations representing almost every aspect of educational work.

As we can read of the heroes of other nations, and recognize the heart of humanity in an Abraham Lincoln, in a Mazzini, in a William Tell, in a Grundtvig, so we can, as educational students, delightedly recognize the heart of humanism, in both individual foreign educational national thinkers, and also similarly in our own. Nothing is, in the long run, attractive in our own national educational thinkers or thought that is really removed from the heart of humanity.

With regard to education and educators in other countries, the encyclopaedia has enlisted, whenever practicable, writers of those countries to give their own specially qualified accounts. These articles were written originally, nearly all of them, in the foreign language of the country to which the writer belonged, and were afterwards translated into English. And we are particularly indebted to them for the large-hearted, large-minded, illuminative help they have given us, in response to our appeal for their assistance.

So that while this encyclopaedia may be regarded as British in so far as the topics selected for treatment are, for the most part, those which have most intimate connection with our environment and our responsibilities, it is also *international* in so far as it discusses the educational systems of other countries and includes articles from representative foreign thinkers on a great variety of subjects.

Previous Educational Encyclopaedias

We have said that such an encyclopaedia has been long a *desideratum*. As far back as 1835 Germany produced its first modern Educational Encyclopaedia-Lexicon (that of I. G. C. Wörle). But the great representative German Educational Cyclopaedias are those edited by K. A. Schmid, in ten volumes (1876–1887), and that by W. Rein (from the Herbartian standpoint), also in ten volumes (1903–10). Austria produced its Cyclopaedic Handbook, in two volumes, in 1906, edited by Dr. Joseph Loos. France had its Educational Encyclopaedia, edited by F. Buisson, in 1911. In the English language the United States was first in the field, in 1877, with the *Cyclopaedia of Education*, edited by H. Kiddle and A. J. Schem. Then followed, in England, the one-volume handbook, edited by Mr. Alfred E. Fletcher. In 1911–13 came the United States *Cyclopedia of Education*, in five volumes, edited by Professor Paul Monroe, a work of outstanding usefulness and devoted labour and scholarship. It is hoped, by the present work, that this British encyclopaedia may give to British education the self-revelation and critical stimulus that Dr. Monroe's work gave to American education. These facts, at least, suffice to show that it is high time that a British encyclopaedia should be forthcoming, to bring us, at last, into line with foreign countries, and at the same time to meet our need, so that we may be able to refer readily to educational facts and ideas, in a century in which so much of old and new are equally strange and overwhelming to the individual teacher who is without access to an index or register of the educational territory.

For criticisms and suggestions as to desirable alterations, by way of additions or omissions, of subject matter, or of correction of any mistakes or lack of clearness which experience in the use of this work may disclose, the publishers and the editor will be very grateful.

FOSTER WATSON.

ILLUSTRATIONS

PLATE	<i>facing page</i>
I. Air Photo of Oxford	1
II. Air Photo of Marischal College, Aberdeen	16
III. University College of Wales, Aberystwyth	32
IV. Rothamsted Agricultural Laboratory, Harpenden	48
IV. The Sample Room at Rothamsted Agricultural Laboratory	48
V. Armstrong College, Newcastle-on-Tyne	64
VI. Edinburgh College of Art. Sculpture Court	80
VI. Edinburgh College of Art. Plasterers' Class	80
VII. Athens. The Acropolis and Parthenon (Temple of Athena)	96
VII. Athens. The Theseum, or Temple of Thesus	96
VIII. Trinity College for State School Teachers, Melbourne	112
VIII. School of Arts, Canterbury College, Christchurch, New Zealand	112
IX. Air Photo of University College, Bangor.	128
X. The Queen's University of Belfast	144
X. Berlin: The University	144
XI. Basket Making at St. Dunstan's Blinded Soldiers' and Sailors' Hostel, Regent's Park, London	160
XI. Birmingham University	160
XII. Training Blinded Soldiers and Sailors at St. Dunstan's Hostel, Regent's Park, London	176
XIII. Air Photo of Cambridge	192
XIV. Bonn University	208
XIV. Birchfield Road Council School, Liverpool	208
XV. Hillbrook Road Elementary School, London	224
XV. County Secondary School for Girls, Clapton, London	224
XVI. Burnside Special School for Invalid Children, Glasgow	240
XVI. Bernard Street Supplementary School, Glasgow	240
XVII. Cambridge, Caius College, Gate of Honour	256
XVIII. Cambridge, Trinity College, Great Court	272
XVIII. Air Photo of Cheltenham College	272
XIX. Residence Buildings, University of Alberta, Edmonton	288
XIX. University of New Brunswick, Main Building	288
XX. Queen's University, Kingston, Canada	304
XX. University of Toronto	304

PLATE	<i>facing page</i>
XXI. Air Photo of Cambridge	320
XXII. Christ's Hospital, West Horsham, The Quad	336
XXII. Christ's Hospital, London, Great Hall	336
XXIII. University of British Columbia, Vancouver, Faculty of Agriculture	352
XXIII. Columbia University, New York City	352
XXIV. Clifton College, Bristol	368
XXIV. Cork University College	368
XXV. Burnside Cripple Schools, Glasgow	384
XXVI. Culham Training College	400
XXVI. Derby Training College	400
XXVII. Morris Dance	416
XXVII. The Peasants' Dance—Crowning the Queen	416
XXVIII. School Decoration, County Secondary School, Long Eaton	432
XXIX. University College, Dublin	448
XXX. Dulwich College, Old and New Buildings	464
XXXI. University College, Dundee	480
XXXI. Dunfermline College of Hygiene and Physical Education .	480



Frontispiece

Air-Photo of Oxford

Photo by Aerofilms, Ltd.

PLATE I

THE ENCYCLOPAEDIA AND DICTIONARY OF EDUCATION

ABA]

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[ABA

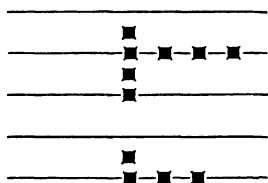
ABACUS.—Originally and specially the Pythagorean multiplication table.

The word is said to have been derived from the first two letters of the alphabet, or from the Hebrew *abag* (dust), because dust was sprinkled over the tablets used for writing, so that diagrams might be traced on the surface. The dust-sprinkled tablet was used in the Far East—as the wax-covered tablet was used among the Romans—by calculators who wrote or drew diagrams on the surface with a stylus.

The form of abacus most familiar to modern teachers is the ball-frame, in which a number of small balls of different colours are threaded on parallel wires fastened to a wooden frame. This abacus has been largely used during the last century in teaching the elements of number, but has been recently superseded by other devices—based generally on the principle underlying it; namely, that ideas of number should first be taught through the eye. The ball-frame abacus is similar in style to forms used during the Middle Ages. In all these earlier European forms, numbers were represented by discs, or beads; but, in China, by rods.

Two chief forms were used in Europe to represent numbers by means of the positions of discs.

In one form, horizontal lines were drawn: the lowest representing units; the next, tens; and so on. Each space represented five of the denomination of the line below it. Hence, 9608 would be represented thus—



In another form, the lines were vertical; and the spaces between the vertical lines indicated the positions of units, tens, etc., from right to left. Counters, with figures written on them, were placed in the spaces. This form of abacus preceded the use of our decimal notation, and ceased to be necessary when the system was devised of inserting a cipher to indicate the absence of a number in any of the spaces. Thus, the abacus frame indicated 80064 by means of the three figures 8, 6, 4—

each in its appropriate space. The introduction of the noughts rendered the use of vertical lines unnecessary.

ABARCA Y BOLEA.—Pedro Pablo, Count of Aranda, was born at Siéntauro, Huesca, in 1719, and died at Épila in 1798.

Descended from a noble family in Aragon, he embraced a military career, and reached the grade of Field-Marshal. He then became Ambassador to the Court of Frederick-Augustus in Poland and, after some years' residence abroad, was appointed (successively) Captain-General of Valencia, then of Aragon, and, at length, President of the Council of Castile.

Endowed with extraordinary tenacity of purpose, Aranda was able to carry out a vast series of reforms, in their essence inspired by the principles of the French encyclopaedists. He reorganized the municipal administration and established the communal procurators, he founded various agricultural colonies in the centre and south of the peninsula by attracting German, Swiss, and French colonists to people the Sierra Morena; he established divers educational and beneficent institutions, and, finally, he enacted a series of measures of a marked national character, such as the reform of the Tribunal of the Nunciature of Madrid, and the prohibition of the publication of papal Bulls without the permission of the Council of Castile.

The Expulsion of the Jesuits from Spain. But the most far-reaching political work achieved by Aranda, one which probably led Voltaire to say "that with half-a-dozen men like Aranda, Spain would be regenerated," was the banishment of the Society of Jesus from the Spanish dominions. On the suspicion that some members of the Society had taken part in the insurrection against Esquilache, and from certain previous investigations and reports by Pedro Campomanes (*q.v.*), the Council of Castile, following the lead of Portugal and France, advised the Monarchy to adopt that radical measure which was secretly carried into effect by the decree of 27th February, 1767. The execution of this decree was entrusted to Aranda. At the very same hour, on the second day of April, the whole of the colleges and establishments of the Jesuits were taken possession of and every Jesuit, without distinction of class, was expelled from the peninsula. The number of Jesuits who left the Spanish dominions amounted approximately to 5,000, of whom 2,641 were resident in Spain.

There can be no doubt that the expulsion of the Jesuits and the subsequent appropriation of their revenues greatly facilitated the reorganization of national education in all its branches. So far as regards primary education, a collegiate academy was created in Madrid destined for the professional training of teachers; and the privileges of the ancient corporation of San Casiano, which up to that period had conferred primary diplomas on teachers, were abolished. In the sphere of secondary education, not only were the schemes of study modified, but various special institutions were founded, among them the Reales Estudios de San Isidro de Madrid. Finally, the most drastic reform was effected in superior or university teaching, the statutes of the Colegios Mayores were so radically changed, that not a few abuses were suppressed: above all, in the provision of bursaries; and the said colleges were subjected to the jurisdiction and the discipline of the universities. E. JARDI.

ABC METHOD.—A method of teaching reading through the alphabet, the letters being learnt in order from A to Z, with their name-sounds. Letters are then combined to form syllables and words, and the spelling of each word is learnt. This was the common method in primary English schools until the introduction of various phonetic systems.

ABECEDARIAN, or ABCDARIAN.—A teacher of the ABCD or alphabet, in use during the period preceding the organization of elementary education in the nineteenth century. The schools established under the Tudors were generally known as grammar schools, and made no regular provision for teaching the elements of reading. Schools in which these elements were taught existed side by side with the grammar schools, and were known as ABC schools, many being conducted by mistresses, and many merely dame schools in cottages. Elsewhere, both before and after the Reformation, the chief part of the Abecedarian teaching was done by priests, especially the old Chantry priests, benefited clergy and parish clerks. Edward VI issued injunctions requiring that this teaching should be continued by the clergy. Schools conducted by the clergy were licensed by the bishop, but others were carried on as private ventures.

ABEL, NIELS HENRIK.—(See CAUCHY.)

ABELARD, PETER.—The eldest son of a nobleman of Brittany, born near Nantes in 1079. At an early age, he showed marvellous genius and ardour for studies, in which he was encouraged by his father, who provided him with the best obtainable instructors. At twenty, Abelard studied in Paris under the famous William of Champeaux, whose lectures were attended by large crowds. Abelard early developed the philosophic turn of mind which leads to the habit of thinking for oneself and of approving only that which investigation proves to be true. He offended his teacher by rejecting Realism, but his great powers led William to describe him as possessing a sublime eloquence and a perfect mastery of logical science. Abelard soon began to teach logic and metaphysics, and continued to do so until ill-health compelled him to travel. At Laon he studied theology under Anselm, and then lectured on theological subjects. At the age of 38, Abelard fell in love with Héloïse, niece of Fulbert, an ecclesiastic. She was a young

lady of great beauty, genius and accomplishments. Abelard married her privately, though afterwards Héloïse denied the marriage, in order that Abelard might be free to take ecclesiastical orders. Shortly after the marriage, Abelard entered the abbey of St. Denis and Héloïse the convent of Argenteuil. Abelard's lectures drew upon him ecclesiastical prosecution and, in 1125, he retired to Brittany as Abbot of St. Gildas. Again prosecuted as the result of lectures in Paris, he was condemned in 1140 to perpetual confinement, and was forbidden to write or teach. The Pope modified the sentence, and Abelard spent the remaining two years of his life peacefully in the Abbey of Cluni. He died in 1142, near Chalons-sur-Marne.

ABELARD.—(See SCHOLASTICISM.)

ABENMASARRA OF CORDOVA.—(See MOORISH LEARNING AND CULTURE IN SPAIN IN THE MIDDLE AGES AND ONWARDS, THE DEVELOPMENT AND INFLUENCE OF.)

ABEN MERVUAN.—See CORDOVA, THE UNIVERSITY OF.)

ABERDEEN, THE UNIVERSITY OF.—Till 1860 the two colleges of Aberdeen were distinct and independent institutions, each exercising university functions. King's College and University was founded in Old Aberdeen in 1494, in the reign of James IV, under a Papal bull procured by Bishop Elphinstone; the buildings are fine and the chapel distinguished for the beauty of its carvings in wood. It is now, as a constituent of the new university, the seat of the faculty of Divinity and some of the Arts classes. Marischal College and University, in New Aberdeen, was founded in 1593 under a charter by George Keith, Earl Marischal of Scotland. The old buildings have disappeared, but the college was rebuilt in 1841, and very considerably extended in 1895, when the Hall and Tower were added as well as the Students' Union. Marischal College is the seat of the other faculties of the University. These are five in number—Arts, Science, Medicine, Law, and Divinity—and all grant degrees. The faculty of Science dates only from 1889: it includes a course in Agriculture. There are upwards of 1,200 students altogether, both men and women, of whom some 450 take Arts, many being intending teachers, and about 300 are students of Medicine; the teaching staff includes twenty-five professors. The library possesses more than 100,000 volumes. The University of Aberdeen shares a representative in Parliament with other Scottish Universities.

In their long history, the two colleges of Aberdeen have been associated with many distinguished men. One of the earliest of these was Hector Boece, or Boethius (1465–1536), the Scottish historian, who, after filling the Chair of Philosophy at Paris, became principal of King's College. The inventor of the reflecting telescope, James Gregory, the mathematician (1638–1675), was educated at Marischal College. Johnson's friend, James Beattie, the poet (1735–1803), was student and professor of philosophy. John Hill Burton (1809–1881), the historian and man of letters, was an Aberdeen graduate. So, too, was William Dyce (1806–1864), the historical painter, to whom we owe the frescoes in the House of Lords, and in All Saints, Margaret Street.

ABERYSTWYTH, UNIVERSITY COLLEGE OF WALES.—A constituent college of the University of Wales. As early as 1854 Mr. (later Sir) Hugh Owen, a notable pioneer in educational progress in Wales, organized a movement to establish colleges for Wales on the model of the Irish Queen's Colleges, but it was not until 1863 that an executive committee was formed with the definite object of establishing a "University." In 1867 this committee purchased for £10,000 a large building at Aberystwyth, erected at a cost of about £80,000, and originally used as an hotel. In 1872 the College opened, and in spite of loyal national support had a very precarious existence until, in 1882, it benefited by a government annual grant of £4,000. A royal charter was granted to Aberystwyth in 1889, four years and five years later, respectively, than to the sister colleges at Bangor and Cardiff.

(See also WALES, UNIVERSITY OF).

ABINGDON SCHOOL.—In 1563, John Roysse, citizen and mercer of London, refounded Abingdon School, which had existed in connection with the great Benedictine abbey long before the Conquest. It was the 63rd year of his age, and the foundation was for sixty-three boys. The school was rebuilt in 1870, and additions were made in 1880, 1897, and 1902. It now consists of excellent and convenient buildings, with all necessary equipment, standing in grounds of about ten acres. There are two boarding-houses, and about one hundred and twenty boys, divided into the customary four sides: classical, modern, science, and army. Besides cricket and football, rowing is cultivated, and there is also a school rifle club.

ABO, THE UNIVERSITY OF.—This Academy, or University, inaugurated on 11th October, 1919, was established in the ancient capital of Finland to provide a higher educational institution for Finland's Swedes, who form 12 per cent. of the Finnish population.

It is hoped that the University, being Swedish in speech and culture, may serve to connect Finland with the Scandinavian North, particularly with Sweden, and so to preserve her place in Western civilization, of which she is an outpost.

A large sum has been accumulated to establish a Finnish University, chiefly for the study of medicine and science at Abo. Abo will, therefore, have two universities, one Swedish and one Finnish. The government of the Finnish University is in the care of a delegation of thirty persons with Dr. Aleksi Käpy, President of the Court of Appeal, as chairman.

ABO, THE UNIVERSITY OF.—(See FINLAND, EDUCATION IN.)

ABRAHAMSON, AUGUST.—(See SALOMON, OTTO.)

ABSOLUTE IDEALISM AND EDUCATION.—(See HEGEL.)

ABSOLUTE PITCH.—(See EURHYTHMICS, THE JAUQUES-DALCROZE METHOD OF.)

ABSTRACT AND CONCRETE.—In logic, the distinction between these terms is the distinction

between a thing, a portion of matter which has a physical existence (concrete), and an idea (abstract), such as a quality or an attribute connected with the thing. The concrete term "book" includes many general qualities and relations, such as size, shape, colour, weight, contents, etc. The abstract term "price" denotes one circumstance associated with the book and considered by itself quite apart from the material book or any other thing which can be purchased. Most attributive adjectives and many concrete nouns have abstract terms connected with them, as tough, toughness; brave, bravery; cloud, cloudiness.

ABSTRACTION.—This is the mental process of withdrawing the mind from all the qualities or properties of an object except the one which is to become the subject of observation and reflection. Abstraction withdraws the mind from the thing possessing a certain quality, in order to fix it on the quality apart from the object. Thus, a number of objects are observed all of which are brittle, and the process of abstraction leads to a conception of the property "brittleness." The mental power of abstraction is almost unknown among young children, and is the latest of the mental powers to develop. It is only in a highly developed mind that the conception of the abstraction "brittleness" is possible without association with material objects which are brittle. Hence, children are led to the abstract idea by means of numerous concrete examples; and subjects requiring abstract reasoning are taught only to elder scholars.

ACADEMIC COSTUMES.—These consist of gowns, hoods, and caps—of forms and colours prescribed by the respective university authorities—and serving to indicate the rank of the wearer as student, graduate, or official of the university. The distinguishing feature of academic costume is the long, loose, flowing gown, usually black, which is a survival of the clerical gown of the Middle Ages, when all scholars were clerics. The hood is a modification of the friar's hood, which was originally intended as a head-covering, and was attached to the robe. Now the hood is the most distinctive mark of the wearer's status, is separate from the gown, and has been superseded by the cap as a head-covering.

The following are the academic costumes authorized by some of the principal British Universities—

ENGLAND

Birmingham. Bachelors' gowns are of black stuff; Masters' of black stuff or silk; and Doctors' of scarlet cloth trimmed with the characteristic colour of their faculty. Bachelors' hoods are of black silk or stuff, and edged with colour; Masters' are of black silk and lined with colour; Doctors' are of scarlet cloth and lined with colour. The characteristic colours are: *Arts*, electric blue watered silk; *Medicine*, cardinal; *Dentistry*, dark red. The honorary LL.D. hood is of scarlet cloth lined with bronze green.

Bristol. Bachelors' gowns are of black stuff, of Cambridge pattern. Bachelors of Medicine may wear stuff or silk gowns. Masters' gowns are of black stuff or silk of Oxford pattern. Doctors wear black silk gowns, or, in full-dress, gowns of scarlet cloth of the Oxford M.D. pattern, but with sleeves entirely of cloth. Hoods are of Cambridge pattern, those of Bachelors being of stuff or silk

those of Masters and Doctors being of silk. Hoods are of a registered colour known as University red. Bachelors' hoods are lined sufficiently to show silk of a lighter shade of University red. Masters' hoods are lined throughout with white silk. Doctors' hoods are lined throughout with salmon-coloured silk; and the same colour is used for the facing of the Doctors' full-dress gowns.

Cambridge.

B.A. Black stuff gown and hood, the latter being trimmed with white fur

All other gowns are of black silk.

Hoods as follows—

M.A. Black silk lined with white silk
 B.D. Black silk lined with blue silk
 D.D. Scarlet silk lined with pink silk
 LL.B. Black silk trimmed with white fur
 LL.M. Black silk lined with white fur
 LL.D. Scarlet silk lined with pink silk
 M.B. Black silk trimmed with white fur
 M.D. Scarlet-silk lined with pink silk
 Mus.B. Black silk trimmed with white fur
 Mus.D. Red puce silk lined with white silk

Doctors of Divinity, Law, Medicine, and Music may wear scarlet gowns faced and lined with the colour of the hood lining.

Durham.

B.A. Gown—Black cord. Hood—Black stuff trimmed with white fur
 M.A. Gown—Black cord or silk. Hood—Black silk lined with purple silk
 B.D. Gown—Black cord or silk. Hood—Black silk lined with blue silk
 D.D. Gown—Scarlet silk. Hood—Scarlet silk lined with purple silk
 D.C.L. Gown—Scarlet silk. Hood—Scarlet silk lined with white silk
 B.C.L. Gown—Black cord. Hood—Purple silk trimmed with white fur
 M.D. Gown—Scarlet silk. Hood—Scarlet silk lined with purple silk
 M.B. Gown—Black cord. Hood—Scarlet silk lined with purple silk and edged with white fur

Leeds. All hoods are of a green shade, and all Bachelors' hoods are lined.

B.A. Dark green
 B.Sc. Middle green
 LL.B. Light green
 M.B., Ch B. Dark green lined with light green
 M.A. Dark green lined with white
 M.Sc. Middle green lined with white
 LL.M. Light green lined with white
 M.Ch. Dark green edged with light green and lined with white

Liverpool. Bachelors' gowns are of black stuff; Masters' and Doctors' gowns are of black stuff or black silk. Bachelors' hoods are of black cloth lined with silk of the distinctive colour of the faculty and bordered with white fur; Masters' hoods are of black silk or cloth lined with silk of the distinctive colour, but not bordered with fur; Doctors' hoods are of scarlet cloth lined with silk of the distinctive colour. The distinctive colours are: Apple blossom silk for *Arts* and *Literature*; slate blue for *Science*; lavender for *Medicine*;

bronze for *Law*; grey for *Veterinary Science*; and dark red for *Dental Science*.

London.

B.A. Gown is of black stuff; B.Mus. }
 B.Sc. gown may be of black stuff or }
 B.D. silk, or light blue stuff }

All other gowns are of silk. Hoods as follows—

B.A. Black silk edged with russet-brown silk
 M.A. Black silk lined with russet-brown silk
 D.Lit. Scarlet cloth lined with russet-brown silk
 B.Sc. Black stuff edged with gold silk
 D.Sc. Scarlet cloth lined with gold silk
 B.D. Black silk edged with red silk
 D.D. Scarlet cloth lined with red silk
 LL.B. Black silk edged with blue silk
 LL.D. Scarlet cloth lined with blue silk
 B.Mus. Light blue silk edged with white silk watered
 D Mus Scarlet cloth lined with white silk watered

Manchester. All gowns are of Cambridge pattern: those of Bachelors being made of black stuff; others, of black stuff or silk. With the exception of the B.Mus. hood, all Bachelors' hoods are of fine black cloth or silk, edged with coloured silk, and have a white fur lining inside the edging; Masters' hoods are lined with coloured silk. The colours used for edging or lining are—

B.A., M.A. Pale blue
 B.Sc., M.Sc. Pale red
 B.L. Violet (broad edging)
 B.Med. Red (broad edging)
 B.Div. Heliotrope

Masters of Surgery, red; *Dental Surgery*, Bachelor and Master, fawn; *Commerce*, Bachelor and Master, orange; *Technical Science*, Bachelor and Doctor, terra-cotta (corded). The B.Mus. hood is of dark blue silk with a 2-inch border of light blue silk on both inner and outer sides.

Oxford. All gowns are of black silk, except that of B.A. which is of black stuff. The hoods are as follows—

B.A. Black stuff trimmed with white fur
 M.A. Black silk lined with crimson silk
 M.B. Blue silk trimmed with white fur
 M.D. Scarlet cloth lined with crimson silk
 B.D. Black silk lined with blue silk
 D.D. Scarlet cloth lined with blue silk
 B.C.L. Blue silk trimmed with white fur
 D.C.L. Scarlet cloth lined with crimson silk
 Mus.B. Blue silk trimmed with white fur
 Mus.D. White silk in brocade lined with crimson silk
 S.C.L.; S.M. Blue silk lined with crimson silk
 D.Sc.; D.Litt. Scarlet silk lined with French grey

Sheffield. Gowns are of Oxford pattern: Bachelors' of black stuff; Masters' of black stuff or silk; Doctors' of black silk or of scarlet cloth faced with green silk. Hoods are of Cambridge shape. Bachelors' hoods are of fine green cloth lined with white fur and edged with a border of silk of the faculty colour; Masters' hoods are of green silk lined with silk of the faculty colour; Doctors' hoods are of red silk lined with silk of the faculty colour. The distinctive colours are: *Arts*,

crushed strawberry; *Pure Science*, apricot; *Medicine and Surgery*, red; *Engineering*, purple; *Metallurgy*, steel grey; *Law*, pale green. The hood of the *Master of Surgery* is lined with red edged with white.

IRELAND

Belfast. Bachelors' and Masters' gowns are of black silk or stuff, and Doctors' gowns are of scarlet cloth. All hoods are edged with blue-watered silk. Bachelors' hoods are of black stuff; in *Arts*, lined with rabbit skin; in *Science*, with green silk; in *Laws*, with pink; and in *Medicine*, with scarlet. The M.A. hood is black lined with blue silk; the M.Sc. is red lined with green. Doctors' hoods are of scarlet cloth lined with the colour of the faculty.

Dublin. In *Arts*, the distinctive lining of hoods is dark blue silk; in *Laws*, pink silk; in *Divinity*, the Bachelors' hood is of unlined black silk and the Doctors' is of scarlet cashmere lined with scarlet silk. Hoods vary in length according to the degree, the highest degree having the longest hood.

National University of Ireland. Bachelors' gowns, Irish black Russell cord; Masters', as Bachelors'—but black Irish poplin for full-dress; Doctors', as Bachelors'—with full sleeves and no facings, or, for full-dress, Irish scarlet cloth and poplin cuffs of faculty colour.

Hoods. *Bachelors'*: Dark green Irish poplin lined with poplin of faculty colour; but B.D.S. is lined with silver grey, 1-inch scarlet edge. *Masters'*: Dark green Irish poplin, lined white poplin, edged with 3 inches of poplin of faculty colour; but M.A. edged blue; M.A.O. edged scarlet and gold; M.D.S. edged silver grey and scarlet, M.Sc.P.H. edged silver, lilac and scarlet. *Doctors'*: Dark green Irish poplin lined with poplin of faculty colour.

FACULTY COLOURS. *Arts*, white; *Music*, coral pink; *Philosophy*, maroon; *Celtic Studies*, saffron; *Science*, St. Patrick's blue; *Agricultural Science*, light green; *Law*, prune; *Science of Public Health*, lilac; *Dentistry*, silver grey; *Medicine*, scarlet; *Engineering*, terra-cotta; *Architecture*, gold; *Commerce*, strawberry.

SCOTLAND

Aberdeen. All gowns are of black silk or stuff. Bachelors' and Masters' hoods are of black silk and Doctors' are of scarlet cloth. Hoods of M.A., D.Litt., D.Phil., are lined with white silk; B.Sc., lined with green silk; B.Sc. (*Agriculture*), edged with green silk; D.Sc., lined with green silk; B.D., D.D., lined with purple silk; LL.B., LL.D., lined with pale blue; B.L., edged with pale blue; M.B., M.D., Ch.B., Ch.M., lined with crimson silk.

Edinburgh. All gowns are of black silk.

Hoods are as follows—

M.A.	Black silk lined with white silk
B.D.	Black silk lined with purple silk, bordered with white fur
D.D.	Black cloth lined with purple silk
LL.B.	Black silk lined with blue silk, edged with white fur
LL.D.	Black cloth lined with blue silk
M.B. AND M.S.	Black silk lined with crimson silk and edged with white fur
M.D.	Black cloth lined with crimson silk
B.Sc.	Black silk lined with lemon-yellow silk and edged with white fur
D.Sc.	Black silk lined with lemon-yellow silk

Glasgow. All gowns are of black silk or stuff. Masters and Bachelors wear black silk hoods, and Doctors' hoods are of scarlet cloth. The hoods of degrees in *Arts* and *Literature* are: Bordered (B.A.) or lined (M.A., D.Phil., D.Litt.) with purple silk; in *Science*, hoods are lined with gold silk and, in addition, the B.Sc. hood is bordered with scarlet cloth; in *Laws*, the lining is Venetian red; in *Medicine*, scarlet silk; and in *Divinity*, light cherry for Bachelors and white for Doctors.

St. Andrews. Gowns are of black silk. Bachelors' hoods are bordered with white fur; M.A. hoods are lined with red silk; other hoods are lined with white satin. The colours of the hoods are as follows:

M.A.	Black silk (with a belt of black silk)
D.D.	Violet—purple silk or cloth
LL.D.	Scarlet cloth or silk
M.D.	Crimson silk or cloth
D.Sc.	Amaranth silk or cloth
D.Litt.	Orange silk
D.Phil.	Yellow silk
Mus.D.	Blue silk

WALES

Wales. Bachelors' gowns are of black stuff; Masters' and Doctors', of black stuff or silk; and, for full dress, Doctors' gowns are of scarlet cloth. Bachelors' hoods are of the Oxford form and, except in *Music*, are of black silk or stuff; in *Music*, of dark blue silk. All Bachelors' hoods are bordered with the distinctive colour of the faculty. Masters' and Doctors' hoods are of the Cambridge form: Masters' of black silk; and Doctors' of scarlet cloth; and both are lined with the distinctive colour. The distinctive colours are as follows: *Arts*, mazarin blue shot with green; *Science*, bronze (yellow shot with green); *Music*, pearl (shot silk of three hues); *Law*, red shot with purple; *Theology*, mazarin blue shot with red.

ACADEMIC FREEDOM.—Ecclesiastical authority in the Middle Ages controlled the orthodoxy of all distribution of knowledge—religious and, for the most part, secular; in the universities (when they were established) and outside of them. When lay masters were admitted, it was only by obtaining the ecclesiastical *licentia docendi* (See LICENSING OF TEACHERS). Teachers of schools without such licence were liable to excommunication. Though the universities were autonomous as against the control of diocesan chancellors, the latter retained control of the licensing of teachers, and this control was passed on continuously in the Anglican Church after the Reformation. It was only in 1869–1870 that the Endowed School Commissioners finally provided for dispensing with the Ordinary's licence. Besides controlling the personnel of teaching, the visitation articles of bishops prescribed and inquired into the actual use in schools of Lily's *Grammar* and Nowell's *Catechism*. Among books required by authority to be taught were not only the Bible (*q.v.*), but also Ocland's (*q.v.*) *Praecepta Anglorum* and *God and the King* (*q.v.*); and all teachers and pupils were required to attend Church services on Sunday.

The mediaeval privilege of *ius ubique docendi* secured freedom of movement of a teacher so that he should not be confined in his function of teaching to one university, but might teach anywhere. The question of freedom of thought apart from the

Church dogma did not arise into prominence as a distinct academic problem till the Renaissance and Reformation. This two-fold spirit asserted the idea of freedom of inquiry, and, once started, the sense that the individual reason must be brought to bear on every province of human thought developed until it reached its fruition in Locke and the Enlightenment (*q.v.*).

Academic freedom thus means the right of the learner and of the teacher to refer all matters of inquiry of students to the test of reason, instead of quiescent acceptance of authority and of tradition. In England, the position of academic freedom was stated for the first time, apparently, by Sir Thomas More, in the *Utopia* in 1516-1517, when he laid it down that a man cannot make himself believe anything he pleases. More announces that the rulers of *Utopia* "do not drive any man to dissemble his thoughts."

First Steps towards Academic Freedom. The beginnings of freedom of teaching, apart from any external limitations—religious, political, or traditional—are to be looked for in the educational institutions established outside the universities and schools. Thus in Sir Thomas Gresham's College (*q.v.*), in the regulations drawn up in 1597, the independence of traditions led to freedom of teaching, which drew to that College, as a centre, fearless investigators of science, so that it was for a long time the home of the Royal Society, which quickly established the close association between freedom and truth. But even in that College, in Divinity it was laid down that the Professor was "to endeavour to confirm the truth of doctrine now established in the Church of England." It is in the region of theology and politics that "tests" have been most frequently applied, and "uniformity" of belief required, before the process of intellectual inquiry has been begun, by the individual teacher and student. Institutionally, probably the first College which did not insist on acceptance of the orthodox or established religion amongst its members of the professional staff was the College of Guyenne under the direction of André de Gouvea (1534). In this College, Catholics and Protestants taught side by side, and made the College perhaps the most progressive and intellectual institution in France whilst this freedom lasted. But such a feature only represented toleration of private opinions, not complete freedom of inquiry, research, and announcement of results of inquiry by each expert in his own department. It appears that the University of Halle, in 1694, was opened to students of all creeds; and that the University of Göttingen was the first, in 1734, to give freedom of teaching and learning in all subjects. This academic freedom, so long enjoyed by Germany, has naturally greatly promoted the work of research as a dominant aim of the German universities.

Religious and Political Hindrances. In England, whilst the demand for freedom of thought has been effectively won and exercised probably more than by any other nation, in almost every direction outside of the universities there remained statutory religious tests which excluded all Roman Catholics and Dissenters. Thus, in 1644, the most eloquent treatise in the English language on freedom of expression of thought through the Press was written by John Milton; and in religious matters, in 1646, Jeremy Taylor, in his remarkable *Liberty of Prophesying*, showed a tolerance of opinion in theology, which Locke emphasized in political opinions in his

treatise on *Toleration* (whilst the spirit of all these views was included in J. S. Mill's outstanding treatise on *Liberty* in 1859); yet religious tests were required on taking degrees up till 1854 at Oxford, and 1856 at Cambridge, and up till 1882 for Fellowships. This regulation excluded Dissenters from the national universities. The only restriction remaining is in the case of the Professors of Divinity, who are still required, in the old universities, to be in orders in the Anglican Church. This exclusion of Dissenters led to the establishment of Dissenting Academies (*q.v.*), and of the University of London in 1825, which was the first English university to dispense with all religious and political tests. All the modern universities have been established free of tests.

Perhaps the most remarkable step taken in the history of academic freedom in England was the cardinal acceptance of the principle of entire academic freedom in the teaching of theology by the institution now known as Manchester College, Oxford (*q.v.*). In 1786, Dr. Thomas Barnes delivered an address to this College, which was then commencing its career as the Manchester Academy, on "Free Learning and Free Teaching," which advocated, with logical directness, the freedom from all "tests and subscriptions" in theology as well as in all other academic studies. Chairs of Theology in this College have never required the acceptance of any foregone conclusions from the professors, nor, in fact, from the students.

Oaths of Allegiance. In the past, the main obstacles to academic freedom have been both theological and political. It has often been judged necessary to require oaths of allegiance to rulers: as, for instance, in the time of Elizabeth, to her as against foreigners; and in the time of Cromwell, to the Commonwealth as against the conquered Stuarts. The necessity of requiring oaths has been grounded upon the fact that the students of a university are the future leaders of the country, and their loyalty to the ruling power was held to be vital. State interference, however, in the old universities, is now ordinarily deprecated; and in the modern universities (although the latter receive financial aid from the State) the claim is made that the pursuit of truth must be left absolutely free from all external intervention. A new form of external pressure has arisen in the United States from the large benefactions of wealthy donors, who have, indirectly or even directly, endeavoured to assert a consequential right of influence in the teaching of certain commercial or social doctrines, or in requiring the cohesion of teachers to those views. There can, however, be no doubt that modern opinion, on the whole, is in the direction of complete academic freedom for university teaching, though, of course, colleges may be reasonably founded with a view to the propaganda of particular doctrines—theological, political, or commercial—if the financial basis be provided by the adherents.

The question of internal freedom of action and thought by students in the university arises in connection with the wider interpretation of academic freedom. (See F. Paulsen: *German Universities*, pp. 265-270.) The same problem may be stated for pupils at the school age.

F. W.

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ACADÉMIE FRANÇAISE, THE.—(See FRANCE, L'INSTITUT NATIONAL DE.)

ACADEMIES.—The Akademia, a public park or garden about two miles from Athens on the north-west, was presented to the public by Cimon (died 449 B.C.), father of Miltiades, the victor at Marathon. A gymnasium was established there, and Plato was accustomed to meet his pupils and converse with them in the groves of the Akademia. The name of the meeting place came to be used as that of Plato's school of philosophy and of the philosophy itself, and the followers of Plato became known as the Academicians, forming one of the four great schools of Greek thought. Plato was succeeded by his nephew Spensippus, who was followed by Xenocrates, Polemon, Crates, and Crantor, all of whom taught the doctrines of Plato with little variation and formed what is known as the Old Academy. At about the close of the third century B.C., the doctrines of the Academy underwent some modifications when Arcesilaus succeeded Crantor as its head. Under Arcesilaus, the school is known as the Middle Academy. Further changes were made by Carneades, the founder of the New Academy, who flourished about the middle of the second century B.C. In the Middle Academy, Arcesilaus directed his inquiries almost exclusively to the investigation of the grounds of knowledge, and approached, to some extent, the Sceptics. Under Carneades, doubt went further, and his leading tenet was that truth always contains a certain degree of error. Carneades withheld assent to such a degree that his pupils were unable to discover his real opinions on any subject.

The revival of classical studies in the fifteenth century led to much imitation of Greek methods, and educational and learned associations in Italy took the name Academy. From Italy, the name spread to Germany, France and England, and more recently to America. In Germany and England, the name is applied to a school as an educational institution, and to learned societies formed to cultivate the study of science or the fine arts. In some cases, as at Geneva, the Academy is the University. In France, the Académie Française was established by Richelieu as a national association to promote the purity of the French language.

ACADEMY OF MUSIC, THE ROYAL.—The present Royal Academy of Music is the second of that name. In 1720 the first Royal Academy of Music was established by a number of nobility and gentry for the performance of operas composed and conducted by Handel at the King's Theatre in the Haymarket. Subscriptions to the amount of £50,000, including £1,000 from the King, were collected for the purpose; and the King allowed the title "Royal" to be used. Many operas by Handel and others were performed with regularity for about eight years, until disputes between the performers led to the breaking up of this Academy in 1728. The present Academy was founded in 1822 through the exertions of the

eleventh Earl of Westmorland, and commenced its public work in the next year under the patronage of George IV, who contributed a hundred guineas to its funds. William IV, Queen Victoria and Edward VII were also patrons of the Academy, which is now under the patronage of their present Majesties.

The objects of the Academy, as set forth in the Charter granted by George IV in 1830, are "to promote the cultivation of the science of music and to afford facilities for attaining perfection in it by assisting with general instruction all persons desirous of acquiring a knowledge thereof."

The governing body of the Academy consists of a President, Vice-Presidents, a body of Directors, and a Committee of Management. The school was first established to be supported by subscriptions and donations, under a Principal and four Professors. Accommodation was provided for twenty boys and twenty girls from 10 to 15 years of age, all of whom were lodged and boarded at the school.

Dr. Crotch was the first Principal from 1822 to 1832, and was assisted by about thirty professors. Among his successors were: Sir William Sterndale Bennett, 1866; Sir George A. Macfarren, 1875; and Sir Alexander Campbell Mackenzie. The Academy provides no accommodation for resident students, but keeps a list of approved persons who are prepared to receive students as boarders.

The School. The School was opened at No. 4 Tenterden Street, Hanover Square, London, W., in March, 1823; and fees charged for boarders amounted to thirty-eight guineas each per annum; but for some years it suffered from financial difficulties. In 1830 the Academy obtained a Charter and the use of the title "Royal," and from that time it began to prosper. In 1834, William IV directed that the proceeds (£2,250) of the Musical Festival at Westminster Abbey should be handed over to the Academy, and four King's Scholarships were founded with this money. Mr. Gladstone, in 1865 and 1866, granted the Academy £500 from the National Exchequer; but as the grant was not obtained in 1867, the Committee decided to resign the Charter and dissolve the Academy. The Charter was returned, and in 1868 the Government grant was revived and the outlook improved.

Enlargements, including a Concert Room, were made in 1876; and from that time the Academy has prospered, with the support of Government grants, subscriptions, donations, and fees.

The work of the Academy was carried on in Tenterden Street until July, 1911, when, although six houses had been absorbed for enlargements, no more space was available. A conveniently-situated site was secured near York Gate, in Marylebone Road, in 1910, and the Academy was transferred to it in time to commence work in September, 1911.

The present curriculum includes all the ordinary branches of theoretical and practical music, as well as choir training, orchestral playing, military music, diction and elocution, drama, deportment, fencing and physical drill, dancing, stage dancing, Italian, French, and German. Students must make one of the subjects of the curriculum their principal study, and, in addition, must take up a second study and attend classes in elements of music, harmony, sight-singing, and (if a vocalist) diction. Every student may practise with the orchestra. All students are taught with a view to their becoming teachers, and the most advanced students are appointed

sub-professors and give instruction in the Academy under the professors.

Ordinary students are admitted if they are found to have had suitable preliminary training and possess sufficient natural ability. Students are not admitted for less than three terms, and a three years' course is required to reach the highest awards of the Academy.

Fortnightly concerts are held during term time, and the students also take part in public concerts given every term in various concert halls in the Metropolis.

The Academy has a library of about 350 scores of modern works, founded in 1903 in memory of Angelina Goetz by her children; a music library open to the use of students for borrowing; and a library of old church music and modern operas of the French school. It also possesses a number of valuable instruments, including a violin by Stradivarius.

Rewards and Distinctions. There are fifty-seven scholarships and exhibitions at the Academy—some open, some limited to Academy students. There are also thirty-eight memorial and other prizes, most of which are competed for annually by students.

The Academic Year runs from September to July, and includes three terms of about twelve weeks each. Every student who has attended throughout the Academic Year is required to undergo an examination in the Midsummer Term in each subject of study taken up, and medals and prizes are awarded. Students who have attended more than three terms may be specially examined by the Principal and, if the examination is satisfactory, a certificate is given of their qualifications. Students who show special merit are elected Associates, with the privilege of using the letters A.R.A.M. after their names. Students who distinguish themselves after leaving the Academy may be elected Fellows (F.R.A.M.).

An examination, open to musical composers, conductors, performers, and teachers, is held twice a year; entrance fee, five guineas. The subjects are: harmony, counter-point, and composition; singing; pianoforte; organ; violin; other instruments; band-mastership; theatrical conductorship. In some of these subjects special exercises are required for candidates who propose to become teachers, and a high standard of merit is demanded. On the results of it the distinction of Licentiate (L.R.A.M.) is awarded.

A special training course for teachers is provided at the Academy, consisting of a course of lecture-lessons by the Professors on—

1. The teaching of children.
 2. The fundamentals of teaching pianoforte technique and interpretation.
 3. The teaching of ear-training and sight-singing.
 4. The teaching of voice culture and class-singing for children.
 5. The teaching of harmony.
 6. The teaching of phrasing and musical analysis.
 7. Lectures on the principles of the art of teaching.
- The course also includes one individual lesson weekly on pianoforte-playing. An examination is held twice a year, and candidates reaching the required standard are recommended for the Associateship (A.R.A.M.).

ACADEMY (SCOTTISH).—This was a type of school established in Scotland from 1760 onward.

It represented a reaction against the narrow classicism of the older burgh school, and also aimed at providing some of the advantages of a university education. The earliest was founded in Perth in 1761; others followed in Annan, Arbroath, Ayr, Dundee, Elgin, Fortrose (Sir James Mackintosh's school), Inverness, etc. Edinburgh came in 1824. The curriculum was professedly scientific and commercial, and, in addition to arithmetic and book-keeping, gave prominence to mathematics, natural philosophy, natural history, drawing, astronomy, and navigation. The academies soon lost their original character, gravitating back toward the traditional curriculum. Being erected by public subscription, they were usually managed by a mixed directorate, including, as a rule, representatives of the town councils. Academy and burgh school were sometimes incorporated in one, but a number of the former still retain their independent management. In 1867, "Academies" numbered twenty-three. J. CLARKE.

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ACCIDENCE.—(See ENGLISH GRAMMAR, THE TEACHING OF.)

ACCOMMODATION.—This (the result of adaptation to surroundings) may be passive or active. To quote Sully (*The Human Mind*, Vol. II, p. 33): "Our permanent surroundings and manner of life tend to grow indifferently, that is, to lose all or most of their effective concomitants. We get used, that is, comparatively indifferent to surroundings, companions, lines of activity, which, when new, were intensely pleasurable. Custom, in like manner, reconciles us to what is unpleasant in our surroundings." Permanent environment leads to passive accommodation of the individual mind to the life the individual leads. The individual, however, may actively adapt himself to a new environment. The Esquimaux and the Arab of the desert have been adapted by force of natural circumstances to their respective environments. The European explorer and colonist have voluntarily adapted themselves to the new life demanded by new conditions.

ACCOMPLISHMENTS.—A term much used in the nineteenth century in reference to the education of women, when, as Herbert Spencer expressed it, "the decorative element" predominated to a greater degree among women than among men. In "seminaries for ladies," the curriculum always included the piano, dancing, and deportment, with some fancy drawing, painting, and needlework. Italian, as an ornamental language, was usually attempted; but subjects of real practical importance received scant attention. The novels of the mid-Victorian period provide interesting studies of young ladies trained in such seminaries, which have rapidly disappeared owing to the growth of new ideas as to the proper education of women, and the introduction of women into almost all branches of industrial, commercial, and literary work.

ACCOUNTANCY, THE TEACHING OF.—A thorough knowledge of accountancy can be acquired only as a result of both practical and theoretical training. The best results cannot be attained

unless the practical and the theoretical teaching are carried on concurrently, and where, in both cases, the student is under intelligent supervision. If this is the case, both sides of the student's training will benefit materially, for his theoretical training will assist him to understand the practical work upon which he is engaged, and will thus give him a grasp which he cannot otherwise attain; on the other hand, his practical work will be of the greatest assistance in connection with his theoretical training—in fact, it may be said to be all important. Students who have had a theoretical training only are very apt to lose sight of the fact that the periodical accounts of a business should form a true record of the results of concrete business transactions, and that the balance sheet should show, as nearly as possible, the exact state of the affairs of the concern at a given date. They too often appear to look upon the various principles governing the preparation of accounts as academical questions, having little relation to the actual business transactions that have taken place, and it is extremely difficult to remove this false impression until they have handled accounts in actual practice, when they become acquainted with the business transactions which are being recorded in the accounts they are preparing. The best practical training is that which may be obtained in a professional accountant's office, as in this case, in course of time, the student will be engaged in the preparation of the accounts of many different businesses, and thus he has the opportunity of gaining a wide experience and a ripe judgment. However, the accountancy student generally finds in practice that his seniors cannot afford the time, or are not inclined, to supervise his training and to teach him the theoretical side; for this, therefore, he must turn to some teaching body if his knowledge is to be complete.

In some cases it is impossible for the accountancy student to be actively engaged upon practical work during the time that he is being trained; in such cases, an excellent substitute is the organization of model offices, in which books are kept and accounts prepared as they would be in practice. But, owing to the inevitably fictitious atmosphere, this training cannot successfully take the place of real practical training.

The theoretical training may be divided under three heads—

1. Reading.
2. Attendance at classes and lectures.
3. The working out of test questions.

Reading. The tutor should advise the student as to the best text-books to read, and how to read them; and the works of as many as possible of the best authorities should be covered in order that the student may obtain a broad view of the subject; and, for the same reason, students should be encouraged to read the accountancy press. The full benefit of the reading will be best attained if the student is able to refer to the tutor for explanations and advice upon all the points which he is unable to understand completely.

Classes and Lectures. In this connection it is thought that the most successful method is to organize a series of lectures, carefully covering the necessary ground. Especially with beginners, too much should not be attempted at each lecture, and the lecturer should endeavour to make the subject interesting by giving practical illustrations wherever possible. A good plan is to work out accounts upon

a blackboard, but, except in the case of very simple accounts, this course is generally found to be impracticable, in which case printed illustrations may be placed in the hands of the students, these being explained by the lecturer. A certain time should be allotted at the end of each lecture, during which students should be encouraged to ask questions, as the lecturer is thus enabled to ascertain what are the difficulties in the minds of his listeners, and it is often found that more is taught in a few minutes' informal discussion than in a most carefully thought out lecture. Organized debates are of very great value if they are properly supervised, and if students can be persuaded to take part freely in the debates.

The Working Out of Test Questions. To complete the system of training, students should be set test questions to work out. The answers should be carefully corrected and criticized. A very good plan is to attach to the corrected papers specimen answers, especially in the case of answers involving the preparation of complicated accounts. In the case of answers dealing with questions of principle, references to text-books may be noted by the tutor upon the students' papers. In cases where the cost of printing is a consideration, an efficient and comparatively inexpensive method of providing the question papers and specimen answers is by means of a duplicating machine.

After correction, the papers should be returned to the students, and thereafter dealt with by the tutor in class, when the proper answers should be explained. Here it is that the system of placing a specimen answer before each student is of great value, especially in the case of questions involving a number of complicated figures—for a weak student will become hopelessly lost if the tutor merely reads out a series of figures, but if he has the specimen answer before him, and this is explained to him by the tutor, he is able to follow in a way that is otherwise impossible. Another great advantage of this method is that the students are enabled, at their leisure, to compare carefully their own answers with the specimen ones, and thus digest the various points raised and correct their mistakes. Further, these corrected papers will prove of great value for future reference and revision.

In the writer's experience, the most successful method of teaching accountancy is to organize a course of instruction, as explained above, consisting of a series of carefully graded lectures, alternated with a series of classes at which the written work of students is dealt with. At both the lectures and the classes, students should be given every opportunity for asking questions. If this latter course is impracticable, then special time should be allotted for debates and informal discussions. In the writer's opinion, this is a matter of very great importance, as students so easily form entirely erroneous ideas as to the principles governing this subject; and it is extremely difficult for the tutor to ascertain these and correct them, unless he has an opportunity of finding out exactly what is in the student's mind. If these informal discussions are carried on in class, the whole class will benefit to a material extent—the difficulty, however, is to persuade backward students to raise in class their points of difficulty, and much, therefore, depends upon the power of the tutor to overcome this natural hesitation.

One of the great difficulties in teaching accountancy is to make the subject interesting and to rivet

the attention of the students, and to surmount successfully these difficulties a great deal depends upon the personality of the tutor.

When dealing with the various classes of accounts, the practical position should be explained, and the exact cause and effect of the different methods should be illustrated. For example, in the case of such questions as the provision of depreciation of assets, students often seem to think that this is a mere academical question, with little or no relation to facts. Therefore, the exact effect of writing off depreciation should be traced through the whole life of an asset, and the exact effects of provision and non-provision should be explained. When dealing with the various principles governing the preparation of accounts, students should be taught to think out and imagine all the surrounding circumstances, and it should be impressed upon them that these principles are based entirely upon the practical requirements of the business world, and are governed by what is known as "common sense."

The system of education adopted by the accountancy profession is based to a considerable extent upon the foregoing principles. For example, the Institute of Chartered Accountants (*q.v.*) provides that each candidate for membership must be articulated for a period of years to a practising member of the Institute, so that he may be given a practical training in his profession. During the years of his apprenticeship, the Students' Societies connected with the Institute organize lectures, debates and classes; and prior to the examinations, students, as a rule, attend special courses of instruction, during which, in addition to attending lectures, they are set to work out test questions which are corrected and criticized. In this way it is ensured that each member shall have a thorough practical and theoretical training: this training, of course, covering a much wider field than is covered by the term "accountancy." F. R. M. DE P.

ACCOUNTANTS AND AUDITORS, THE SOCIETY OF INCORPORATED.—This society was established in 1885, and its objects are similar to those of the Institute of Chartered Accountants. It is composed of Fellows and Associates.

The society holds three examinations for persons desiring to become incorporated accountants—

Preliminary. One paper on each of the following subjects: English history, English grammar and composition, a foreign language, arithmetic, algebra, and geometry. Matriculation and similar examinations are accepted as equivalents, provided the foregoing group of subjects was included.

Intermediate Book-keeping; general commercial knowledge; partnership and executorship accounts; law relating to partners and executors; rights and duties of liquidators, trustees and receivers.

Final. Advanced accounting, auditing, partnership, law relating to partners, arbitration, mercantile law, joint stock and bankruptcy law, rights and duties of liquidators, trustees and receivers.

The Institute has offices at 50 Gresham Street, London, E.C.2.

ACCOUNTANTS, THE INSTITUTE OF CHARTERED.—An accountant is a person skilled in keeping books of accounts; and many banks, railway companies, and public companies usually employ such an official. An accountant must possess

a knowledge of the law in relation to bankruptcy, companies, and mercantile business. The Institute of Chartered Accountants was founded, and incorporated by Royal Charter, in 1880, to promote the welfare of accountants and maintain a high standard of efficiency in accountancy.

A person wishing to become a chartered accountant must first become an articulated clerk with a Member of the Institute. As a qualification for his articles, he must pass the Institute's Preliminary Examination, which is similar to, and of the same standard as, an Oxford or Cambridge Senior Local Examination. Similar examinations are taken as equivalent to the Preliminary Examination of the Institute. After two and a half years' service, an articulated clerk may take the Intermediate Examination, in which the subjects are book-keeping and accounts; auditing; rights and duties of liquidators, trustees, and receivers.

The Final Examination includes the subjects of the Intermediate, together with the law of bankruptcy, joint stock companies, arbitrations and awards, and mercantile law.

The fee for each examination is £2 2s., and one guinea for exemption in the Preliminary.

Accountants are admitted as Associates or Fellows (fee, ten guineas), and pay annual subscriptions of two and five guineas respectively.

The offices of the Institute are in Moorgate Place, London, E.C.2.

ACKWORTH SCHOOL.—(See FRIENDS' SCHOOLS.)

ACLAND, ARTHUR HERBERT DYKE.—Was educated at Rugby and Christ Church, Oxford; and ordained in 1873, but retired from the ministry. While at Christ Church he interested himself deeply in social and political questions, and collected round him a number of students of similar tastes, who were known as "The Inner Circle." In 1875 he became Principal of the Military School at Cowley. In 1885 he was elected to Parliament as the Liberal Member for Rotherham. He became very prominent in Parliament and in the country for his advocacy of the extension of intermediate and technical education; and when Mr. Gladstone formed his Ministry in 1892, he chose Mr. Acland as Vice-President of the Council on Education, a post which he held till 1895. Mr. Acland was joint-author of a *Handbook of Political History of England and Working-men Co-operators*.

ACQUIRED CHARACTERS.—Every living being is susceptible of undergoing a change in its characters—material or psychical—in response to the action of its environment. The readiness of sight of the scout or proof-reader, the agility of the instrumental musician, the powerful arms of the blacksmith, are all characters so acquired by the individual. We may enlarge our definition by adding increase of aptitude for acquiring new characters—versatility in a given direction among such acquired characters. The question that has perplexed biologists for many years is this: Are such characters transmitted from the being that acquires them to its offspring?

In lowly forms, which multiply simply by division into new organisms, and where there is no tissue differentiation between those cells that constitute the working body (*soma*) and the germ-cells reserved for reproduction (collectively termed *stirp*), there is no question but that characters derived

from the environment are transmissible. The facts of bacteriology show many instances of microbes being attenuated in their virulence, or intensified in their malignity. We have, therefore, to consider only those organisms—higher plants and higher animals—where the distinction of body and germ-cells, “soma” and “stirp,” is marked.

Till recently, the belief in the transmissibility of acquired characteristics was general, though at intervals, notably by Galton, it was regarded with some suspicion. With growing knowledge the doubts increased, until, in the last two decades of the nineteenth century, the influence of Weismann was strong enough to found a school of evolutionists who proclaimed as a dogma that acquired characteristics were *not* transmissible; and that the numerous examples which pointed to the contrary were ill-authenticated, inaccurately observed, or susceptible of other, more valid, explanation. Their influence and assurance was so great, that brilliant expositors such as Benjamin Kidd and Archdall Reid treated the question as closed, with the assent of “all competent naturalists.” However, throughout the controversy among zoologists of mark, opinions have been at least equally divided, and among botanists the immense preponderance has been in favour of hereditary transmissibility. J. Arthur Thomson, in his *Heredity*, has given a brief history and a very candid exposition of the question; he has fully stated the numerous “misunderstandings” which have made many of the advocates of transmutation into easy victims of such subtle dialecticians as Weismann. But the experimental study of acquired characters has during the last decade adduced a body of evidence in its favour, which he has dealt with far too cursorily. Before discussing the actual question, we must examine the cause of that preconception which rendered so respectable a body of biologists unwilling to adopt the theory of transmissibility.

Parallel Induction. In animals the germ-cells are distinguishable at an early stage of embryonic development, at least in all groups above the Coelenterates. Now, there is no visible mechanism to keep the germ-cells *en rapport* with the stimuli that affect the body, much less to inform them or instruct them of the adaptive responses and alterations of the body in consequence of these stimuli. Where such a stimulus as light, heat, aeration, or nutrition has affected the body, possibly it may have also directly altered the germ-cells, so that on liberation they will show affection similar to that of the body; but this is not a true transmutation. Such a phenomenon has received the name of “parallel induction.” On this point we may say that it is inconceivable that a stimulus which has modified certain structures of the body in most complicated ways should so affect the germ-cells directly as to induce them on liberation to develop into a similarly modified offspring. Where the case is simple, as, for instance, that a starved hen's eggs should grow into puny chickens, parallel induction may occur. But even there, the defective nutrition comes indirectly to the egg, as it influenced the hen generally, and the hen influenced its egg. Still, parallel induction may occur more readily in plants than in animals; for, in plants, the germ-layers which constantly give rise to new growths of the soma, as well as to germ-cells, are more directly accessible to changes in the environment.

Elsewhere, the possibility of parallel induction appears inadmissible, as Semon has shown (*Das*

Problem); for the transmission of acquired instincts, it is, of course, absurd.

The question has been put by Hartog in the form of a syllogism: (1) the factor (*i.e.*, transmutation of acquired characters) is one of extreme utility to the race, and useful characters tend to be retained; (2) if, then, it existed in the primeval ancestors of higher organisms, it would probably be retained, unless its retention were a physical impossibility; (3) now it undoubtedly does exist in many *Protista*, which biologists agree are equivalent to the ancestors of higher organisms; (4) again, its persistence in higher organisms is not physically inconsistent with the cellular differentiation characteristic of these, for it has been demonstrated in different cases; (5) hence, we conclude, it is extremely probable that its persistence is general.

Experiments of Biologists. Among the cases referred to, we cite the following, mostly from the accounts given by Semon (*Das Problem*)—

The spotted salamander is piebald, black and yellow. When it is kept on yellow soil, the yellow markings extend at the expense of the black; whereas the reverse takes place when the animal is kept on black soil. The young obtained from animals so modified, in both cases raised on neutral soils, show the modification induced in their respective parents.

Certain caterpillars, whose natural food is ordinary leaves, only slowly learn to eat pine-needles in default of their natural diet by attacking them at the point, their jaws being unable to get a grip on the thick rounded surface elsewhere. The offspring of these attack the pine-needles at the point directly. The new characters may mendelize when crossed.

Nature's Experiments. Reduction of the pigmentation of the eyes, and of the eyes as a whole, can be induced in animals of various species by rearing them in the dark. In cave animals, we find every degree of reduction of the eye down to its complete absence. In artificial caves abandoned for centuries, we find transitional forms. In some cases at least, the rearing of the young under appropriate conditions of illumination may determine the reversion of the imperfect eye to a complete functional organ: this has been done for the blind salamander (*Proteus*) of the caves of Carniola; the experiment took five years.

Flatfishes have the lower side deprived of pigment, and this bleaching occurs while the young are still symmetrical and swim in the normal position, belly downwards, but rest on the side, which, later, is permanently turned down. When, at this stage, by suitable arrangements, all illumination comes from below, the under side long remains pigmentless, and only begins to show pigmentation after two months.

In *Amphibia*, the fore-limbs protrude through the branchial chamber, and force their way through its outer wall. Sometimes a thinning of the wall is formed in advance, or even a perforation: this must have originated through the repetition of the forcible rupture in successive generations: it is formed even where the rudiments of the fore-limbs have been removed early.

Henslow has adduced various cases in plants where acquired characters transmitted by heredity afford the most probable explanation of the facts.

Hypotheses of Transmission. Various hypotheses have been advanced to account for the influence of the body modified by its environment being transmitted to the germ-cells within. Darwin suggested

that each part of the body transmitted minute particles, "gemmules," which were stored in the germ-cells: this is the hypothesis of pangenesis. Herbert Spencer suggested molecular transmission also; his view was modified by Haeckel, who supposed the body to be composed of minute "gemmaria" of definite geometrical arrangement, or "lie," which were susceptible of acquiring a different "set" when the body also acquired a corresponding "set." Hering, the physiologist, interpreted all inheritance as memory continued from parent into germ and offspring, and suggested that this transmission took place through vibrations, or perhaps better through the attunement to vibrations; and this clearly admits the transmission of acquired characters. This view was accepted by Haeckel. Samuel Butler independently formulated the view that heredity was transmitted memory, and, after reading Hering's earlier work, further developed the vibration hypothesis. Thus, he suggested that the sterility of hybrids was due to the clashing of incompatible memories. A cognate view is adopted by Rignano, with the addition that he supposes the germ-cells to act as complex accumulators, storing up different modes of energy. R. Semon, again, has taken up this view, substituting for "memory" the Greek *mneme*. Like Orr, he supposes that the effect on the germ depends on the action of the nervous system. Among those who regard this view as more than plausible, Hartog wrote in 1898 that unconscious memory (i.e., *mneme*) may be correlated with complex chemical changes in orderly succession. Since then, Cunningham has developed this view, profiting by Starling's discovery that certain organs secrete chemical substances (*hormones*), which have the effect of enabling other organs to perform their respective functions.

The view taken of this question by thinkers on social science and pedagogics cannot be overestimated. Does our nurture fail to produce an enduring effect on the race, or can it induce cumulative effect on successive generations, raising each a step, however small, above the preceding one? We have been told with impressive dogmatism, by those who profess to preach from the only consecrated pulpit of biological science, that the former alternative is demonstrably true. But, while at least equal personal authority can be shown on the side of the second alternative, we have now learned that the facts justify us in accepting it with a cheerful heart that we have full warrant for the hope and belief that our efforts for the nurture of the present generation will have an enduring effect on the nature of those to come later.

M. HARTOG.

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ACQUISITIVENESS (mental)—The instinctive tendency to "acquire" knowledge, especially that which is attractive or pleasurable, or which satisfies natural desires.

ACROAMATIC METHODS.—Aristotle taught in the gymnasium called the Lyceum, and lectured as he walked up and down. In the morning he lectured to select pupils, called "esoteric" (intimate); and his lectures were called "acroamatic" (communicated orally), in contradistinction to written or published matter.

ACTIVITY.—Education through activity is the watchword of one school of educational reformers, but the activity they demand is not activity as such, but the special form of activity which involves purposive movement. This form of activity, more accurately known as motor activity or motor expression, will alone be considered here. All systems of training necessarily include some attempt to stimulate and control the pupils' activity; but, so long as the intellectual conception of education was dominant, this aim was subordinated to other considerations. In recent years, however, successive social movements and changes in the world of thought, have led to the fuller recognition of the importance of activity. Thus we have witnessed the introduction into the schools of organized games, practical science, manual work, technical instruction, and the like. But the tendency has been to confine the encouragement of activity to certain definite departments of school life, whereas we are now faced with the demand that similar methods should be systematically applied throughout all types of schools. One group of writers on education has gone so far as to subordinate knowledge

and feeling to activity, and to speak of training in behaviour or activity as the primary aim of education. [See *e.g.*, James: *Talks to Teachers* (pp. 28 f.) Dewey: *Educational Essays*, and *The School and the Child*. Bagley: *The Educative Process* (p. 22).] It is not necessary, however, to adopt this extreme position in order to maintain the view that the pupils' own activity should play a more prominent part in the process of education than it does in most schools at the present time. Some change in this direction seems, indeed, to be demanded both by the teaching of psychology and by the results of educational experiments. The statement that we learn by doing has been shown to hold, not only when our learning is by imitation or by experience of results, but also when it is mainly a process of ideal construction. It is evident, for instance, that manual skill and habits of behaviour are acquired through our activity; but it is also true that our scientific knowledge and our ethics and philosophy are abstract and unreal unless based upon adequate experience derived from our active contact with actual things and persons. Again, the activity in which an emotion finds expression is an essential element in the emotional process and, if the activity is checked, the process is diverted from its normal course. The serious effects which may follow from the repression of activities connected with a strong emotion have been emphasized by Freud and others, but the same principle holds good in the case of any interest. Unless appropriate opportunities for activity are provided, the interest inevitably suffers.

Effect on School Life. The recognition of the importance of activity has led an increasing number of schools to modify their aims and methods. The boy or girl is trained to be a worker rather than a scholar in the narrow sense, though it may be a worker in some field of thought. A practical acquaintance with some typical human activities, and the knowledge derived from first-hand observation or experiment, are valued highly. Hence manual work becomes important as a means of intellectual and moral training. The manual training schools, says William James, "will give us citizens of an entirely different intellectual fibre." [See *Talks to Teachers* (p. 35).] In a few schools the pupils have been taught to carry out, on a small scale, certain important processes. In some schools a systematic attempt is made to reproduce on a small scale certain activities of importance in industrial or social life. Thus the pupils may be taught the elements of some skilled trade, either as part of a general education or as a preparation for a specific type of calling (*e.g.*, in Junior Technical Schools); or they may perform some of the fundamental operations of social life as is done by different schools in different ways (*e.g.*, the Chicago University Elementary School described in Dewey's *The School and the Child*). Again, they may develop a legislative and judicial system of their own, as is done to some extent in the public schools and others in which the common life is organized on similar lines—a striking example of a thorough-going application of which system was the Little Commonwealth at Evershot, in Dorset. Even if the traditional curriculum is to a large extent retained, the classrooms may become the scenes of co-operative activity, as *e.g.*, in dramatic representations. The results attained by the encouragement of activity on these and similar lines prove that the movement is one of great educational significance.

The Importance of Purpose. In order, however, that activity may play its proper part in the educational process, it is necessary that much of the activity should be purposive—the expression of the child's own interest—and that it should be subject to objective or social control. Thus, for example, the boy should make things, not solely for the sake of the skill acquired by making them, but partly for the value of the product. Boys do not become good carpenters by making useless models. It is true that the accomplishment of some difficult task, or the performance of some feat, may have a real interest of its own, and that this interest may have great educational value. But the interest in achievement is normally associated with an interest in the results attained, and should be developed in connection with it. On the other hand, activity brings us up against the realities of our environment, and is effective only when it recognizes the objective conditions with which it has to deal. A boy must saw his wood straight if his box is to be shut. He must use tact and judgment if he is to be successful as a football captain. The control to which activity is subject ought, however, to be that involved in the conditions under which it is carried on—not the control of arbitrary external authority. School rules, for instance, should embody the conditions of healthy corporate activity, and not be felt as despotic enactments. Control thus exerted is not antagonistic to purposive activity, but is necessary to its efficiency. Activity is a potent instrument of education, because it helps the individual to master his environment by obedience to its laws.

H. BOMPAS SMITH.

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ACTORS AND ACTRESSES, CHILDREN AS.—
 (See STAGE, TRAINING OF CHILDREN FOR THE)

ACTUARIES, THE INSTITUTE OF.—In ancient Rome, the *actuaris* was an official who recorded the proceedings, *acta*, of the senate or other public bodies; and, as first used in England, the word "actuary" had a similar meaning. At present, the term is applied only to those who make calculations necessary for fixing insurance premiums. The actuary bases his calculations on probability in relation to human life, and must have considerable knowledge of mathematics and of law. Such Acts as the National Health Insurance Acts of 1911 and 1913 greatly increase the number of actuaries in the Government service and in great insurance societies. The interests of the profession are protected in Great Britain by the Institute of Actuaries, Staple Inn Hall, London, W C 1; and the Faculty of Actuaries in Scotland. The former was established in 1848 and incorporated by Royal Charter in 1884. Examinations are held to admit persons to the Institute as students, associates, and fellows.

Persons are admitted as probationers, without becoming members of the Institute, for a fee of 10s. 6d.; and these are entitled to use the classes for students and to borrow text-books from the Institute Library.

For admission as a student, an applicant must produce evidence of his education up to the standard of the London Matriculation, the Senior School

Examination, or the Senior Local (Ox. or Camb.) Examination.

For admission as an Associate, the candidate must be a member of the class of students and pass Parts I-II of the Institute's Syllabus; while for admission as a Fellow, Parts III-IV must also be passed.

Part I is mathematical, including logarithms, theory of probability, elementary calculus, interest and annuities with construction of tables.

Parts II-IV are strictly technical and professional, and deal with assurance, valuation, book-keeping, banking, stocks and securities, law of contract and property, law relating to assurance and insurance companies and to friendly societies.

Fees are charged in connection with each part of the Syllabus of Examination.

ADAPTATION (see ACCOMMODATION).—This may be natural or the result of training. Nature adapts, or fits, plants and animals to their environment; man is educated to adapt him to the conditions of the life he may be expected to lead. The gift of instinct is an agent in the natural or passive adaptation of animals; in man, the gift of reason enables him to adapt himself to his surroundings.

ADELARD.—Known as Æthelhard in England and said to be a native of Bath; flourished in the twelfth century. He studied in France, and travelled in most of the countries surrounding the Mediterranean. He acquired an extensive knowledge of Arabic methods of education and translated Euclid's *Elements* from the Arabic. He also wrote *Perdifficiles & Questiones Naturales*, a treatise on Astronomy and the Abacus. His *De Eodem et Diverso* (on Identity and Difference) is an allegory representing a contest for the soul of man between worldly fortune and pleasures and the liberal arts.

ADENOIDS.—(See BREATHING EXERCISES FOR CHILDREN.)

ADENOIDS.—(See NOSE, THE HYGIENE OF THE.)

ADOLESCENCE.—This includes the years from pubescence to relatively complete maturity. In temperate zones it usually extends from the fourteenth to the twenty-fifth year for boys, and is one or two years earlier for girls. In the United States, Crampton has found a range of four years in the attainment of pubescence.

Physical Characteristics. The body grows more rapidly at adolescence than at any time after the first year of life. Growth in height begins at eleven or twelve years in girls and a year or two later in boys, and is nearly complete by seventeen or eighteen. Growth in weight follows, reaching its culmination by seventeen or eighteen, but continuing more slowly for an indefinite period. Studies by Moon, West, Hrdlicka, and others indicate that, before twelve or thirteen years in girls, and fifteen in boys, the spine grows more slowly than the leg bones; afterwards, more rapidly. Between thirteen and twenty-five years, the epiphyses of the arm, shoulder, and leg bones ossify; the pelvis of girls is modified both in shape and size, and the bones of the sacrum and coccyx unite. Ossification of the skull is completed about the twenty-second year. Porter found that in girls the length of the face increases most between twelve and fifteen years, and in boys between fourteen and seventeen;

while, in both, the breadth increases most between fourteen and fifteen years. Between twelve and nineteen years, the average distance between the eyes increases 10 mm. Muscle weight is estimated to be 32.6 per cent. that of the body at fifteen years, 44.2 per cent. at sixteen, and 45 per cent. at twenty-six. The growth of individual muscles is parallel to that of the bones to which they are attached. Mühlmann's measurements show the most rapid increase in heart weight between fourteen and fifteen years, with a slow rise from ten and a slow fall to twenty-five years. Guy estimates that the rapidity of the beat lessens three to six beats per minute between twelve and twenty-one years. Truslow gives the ratio of the volume of the heart to the width of the ascending aorta as 56 to 20 before puberty and 97 to 20 after, so that the blood pressure is greatly increased and circulation time lengthened. Marro states that the chest circumference increases .62 to .76 m. between eleven and nineteen years; Zak gives the increase from fourteen to fifteen, the period of most rapid growth for boys, as 4.1 cm. Vital capacity is at its highest a year later, according to Kotelmann; but runs parallel, according to Pagliani. In girls, Pagliani found that both chest circumference and vital capacity grow more regularly.

Per cent. of growth of brain weight continues to diminish; but Kaes and Vulpius believe that in the later teens the middle layer of the cortex develops, first in the parietal and central parts, and then in the temporal and frontal, correlating with the development of abstract thought.

Probably the digestive tract, including the liver, alters relatively little during adolescence; but the composition of the urine is greatly modified. The pancreas and spleen grow more rapidly; the sebaceous, salivary, and probably the lachrymal glands function more and the pigmentation of the skin is altered. On the other hand, the thymus and thyroid glands atrophy more rapidly and the fat lessens, especially in boys. The few statistics as to testes and ovaries show that they are growing rapidly in weight and altering in dimensions.

Intellectual Characteristics. On the intellectual side, we must note, first, that the rapid growth of the middle layer of the cortex seems to condition a general excitability which may pass into abnormality if not guarded against by developing the sense of reality and the synthetic aspects of mental work. Meumann believes that, while the child below twelve years thinks and wills in individual impulses, the child above emphasizes the relating aspect more and more (e.g., simultaneous apprehension of unarranged points or lines is 3-4 for the twelve year old, 5 for the fourteen year old, and 4-6 for the adult). Estimation of the number of simultaneous sounds rises from 5-6 for eleven and twelve year children to 6-8 for those of fourteen years. Power of fixation of attention also increases greatly after twelve years, and, with it, better memory for sense perceptions and greater reliability of testimony. Turning to the special senses, Hall states that taste becomes more discriminating and appetite more capricious, sweets, sour, and animal food being more desired, and a craving for stimulants often appearing. Smell seems to become more acute, and the love of strong perfumes marks this age. Probably the temperature sense is heightened in the later teens. The heightened activity of the skin glands increases the skin consciousness, so that Hall notes a touch hunger,

showing itself in the desire to rub and scratch the skin, though fineness of touch discrimination lessens with the increasing skin surface, since no new touch end-organs are formed after birth. Carman and Gilbert believe that pressure-pain sensibility also lessens. Meumann's tests on boys of thirteen to fourteen years with the kinematometer showed in them the same power of discrimination as in himself, and estimations of short distances are as correct in twelve year old children as in many adults. Active perception of visual form seems to reach a maximum in boys at fifteen, and then to diminish slightly. Discrimination, both of shades of colour and intensity, seems complete at fourteen; but Gilbert found that form perception improves between fifteen and sixteen, and that the simultaneous apprehension of letters increases throughout the college course. The love of drawing increases in some children, and both sexes crave strong colour stimuli. Seashore's tests indicate that discriminability of tones does not improve between ten and fifteen, but Gilbert found a steady growth. On the side of musical performance, the change of voice and lessened motor control are likely to cause self-consciousness and dislike of expression for a time.

Memory tests by Lobsien and Netschajeff show that the greatest rise is past by twelve years. After this, there is a slow but steady progress in the memory of objects, inarticulate sounds, numbers, and words naming sounds, visual objects, touch and muscle qualities. On the other hand, words expressing emotion and abstract ideas are much better remembered during adolescence than before. The greatest difference between boys and girls comes between eleven and fourteen years. For isolated words, Boyd found the memory best at thirteen years for girls and fourteen for boys, but at seventeen or eighteen for sentences and an idea involving an abstract conception. Immediate retention, according to Meumann's tests, improves most rapidly between thirteen and sixteen years, then more slowly, reaching a maximum at twenty-five. Winch's and Smedley's tests harmonize with his. All Aussage tests show that now the relational aspect of memory comes more to the front. Errors due to suggestive questions are only one half as numerous at fourteen, and one third as numerous at eighteen years as at seven. Colvin and Myers found that the image type is also especially modified in early adolescence, changing gradually from the visual and concrete to a relatively verbal type, which is likely to involve auditory and motor as well as visual factors, and in which associations and meanings play a larger part than at an earlier age.

Though inexact, the study of A. J. and I. Rosanoff on associations in normal children shows that, from eleven years onward, reactions are more like those of adults than of younger children. Goett found the same true of children over twelve: repetition of the reaction word is only about half as frequent; contrasts and compounding of the stimulus word with another increase noticeably; predicate and subjective or personal reactions diminish; and the sex complex is practically always present. All observers agree that reaction times lessen, probably becoming as short as in the adult by the seventeenth year. Studies of Ziehen, Meumann, Winteler, Wreschner, and Rusk show that reaction times become longer and, presumably, associations more difficult in the following order: (1) To react with a part if a whole is named; (2)

the reverse; (3) to name a co-ordinate; (4) to name a free concrete term; (5) a super-ordinate; (6) a subordinate; (7) a free abstract term; (8) a causal relation. Ziehen found no causal relations below eleven years, and Meumann found a great increase in them at thirteen and fourteen years, especially in natural science. This interest in cause, together with the heightened sensory activity and love of exercise, forms the basis for the new interests in Nature and Art. Hall emphasizes the former especially. Youths and maidens love to think of infinity in space and time, and to become filled with the sense of the vastness of the universe. The heavenly bodies and the sky are sources of mystery and stimuli to the imagination, the feelings, and the religious sentiments; while, at the same time, the practical applications of science appeal to them strongly. The formal science usually taught in secondary education has, however, little interest for them.

Hancock's returns show that ability in arithmetical reasoning increases rapidly between thirteen and fifteen years, and Lindley's that interest in arithmetical puzzles culminates somewhat after this age. Mrs. Barnes found that interest in the truth of a narrative is slight even at fifteen years, while that in name and age is strong from the beginning. Miss Patterson's returns also indicate that understanding of the meaning of historical dates is small before twelve years. Studies by Williams, Conradi, Bullock, Henderson, and Kirkpatrick all show a great increase in the reading curve, culminating at fourteen or fifteen years, and then steadily falling. Many youths spontaneously set about enlarging their vocabulary by the aid of slang, foreign languages, and the study of the dictionary. The sentence structure usually becomes more complicated and the use of words more precise.

Attitude to Society and Religion. The attitude towards society and religion changes profoundly also. Naturally, the development of the sex instinct modifies all relations to the opposite sex. Many students believe that there is, first, a tendency for each sex to draw away from the other, and that, therefore, co-education during the high school age is undesirable. This is neither adequately proved nor disproved as yet. Later, the opposite sex is attractive, and motivates a large part of the adolescent's behaviour. Boys tend more to "show off"; girls, to develop reserves and to exercise critical judgment. Both develop pronounced tastes for personal characteristics in the opposite sex. Normally, selection and mating culminate in marriage, usually between twenty and twenty-five years for women in temperate climates, and somewhat later for men.

In the adolescent, the social instinct also enlarges in all directions, especially in hero-worship and in friendships. Team-work becomes characteristic of most games; gangs and clubs multiply. The individual's attitudes toward the various social groups which he touches run the gamut from the dictatorial to the slavish. Finally come the highest developments of the social instinct in morality and religion. The moral judgment of the adolescent is markedly crude, but his conscience is sensitive exactly because his social sense is now so new and acute. He is rebellious against unreasoning obedience to any authority, but much on the alert to be the type approved by his associates. He confuses the customary and the right when his own group follows the customary; but when his group stands

for the new right against the customary wrong of another group, he learns the distinction. The adolescent is as yet more likely to tell the truth to his friends than to his enemies, to justify an unrighteous bargain because it is clever, and to rebel against just punishment unsympathetically administered. But he is uncasily conscious of the defects of these attitudes and needs but little stimulus to attain higher ones. This additional spur usually comes from religion, which tends to convict the adolescent of his unrighteousness. The child attributes the blame for his unhappiness or misfortune to other persons; but during adolescence there is a remarkable change, most truly called conversion, marked by the adolescent's consciousness that he himself is often the guilty cause of harm to himself and to others. In our civilization this usually takes the religious form of conviction of sin and a sense of helplessness without Divine aid; but even if there has been no religious instruction, it usually occurs in normal youths and maidens because they find themselves unable to meet the more complicated social situations into which they are now thrust, and the resulting condemnation and contempt of their associates convicts them of weakness if not of sin. This conviction, or the lack of it, together with the youth's faith that he can transcend his defects, is, perhaps, the most significant single indication for future success or failure, because it makes for teachableness or for incorrigibility in all fields of effort. Studies of religious conversion record the largest numbers of conversions between sixteen and seventeen for boys and a year or two younger for girls, followed in a considerable number of cases by a period of backsliding, and at about twenty by another rise of religious interest on a less emotional and more reasonable basis. It is a question whether the backsliding is not due to the unwise forcing of dogmas upon the adolescent, thus necessitating a later painful reconstruction of belief. Psychologically, it is significant that nearly all races mark the attainment of pubescence by rites and ceremonies intended to test the worthiness of the youth for adult responsibilities and privileges. Often prolonged fasting and the endurance of severe physical pain are required; the ability to resist fear is tested; reverence and obedience to the spirit world are demanded, and in some cases the youth's probation is not completed until he has heard a special call from the great spirit. In modern civilization the only representative of these initiation ceremonies is confirmation, which is too commonly limited to a narrow religious meaning, but which should mark the fact that the youth has faced about from the egoistic outlook to the altruistic, and is acquiring the endurance and steadfastness which can belong only to the person who has lost small interests, fears, and hopes in the search for the ideal man. With this spiritual change, the youth passes into later adolescence, and is well on the way to the adult standpoint.

A. E. T.

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ADOLESCENT CHILDREN, THE PHYSIQUE AND STAMINA OF.—The power of sustained intellectual effort and attention depends upon physical factors, and not only varies according to the individual, but also varies in the same individual during different periods of life. It by no means corresponds with the growth of bodily framework, but is really dependent on the internal organs of the body, such as the heart, lungs, brain, and nervous system, whose precocity or delay in development determines the date of manifestation of the fuller powers we call adolescence. It is comparatively easy to measure both mental and physical attainments, it is difficult to measure capacity for either physical or intellectual work, which is not at all the same. In spite of numerous examinations and class markings in registers, we have no recognized standard for measuring physical or mental vigour of children, and studying the causes why particular children surpass or fall below an average. We judge children's powers by their age and by their height. Both are misleading, for adolescence varies from 12–15 years. For this reason it is frequently difficult to decide whether a given pupil is putting forth adequate, inadequate, or excessive effort. We often think it is a matter of incentive, and a boy can work if he tries. The incentive is provided by the influence of the home, of the school, and of the general tone of the other boys, for these all vary; but the study of incentive can hardly begin until some provisional standards of capacity are recognized. Perhaps the nearest approach towards obtaining such measurements will be found in the recognition and study of fatigue, and its ultimate issue—exhaustion.

Fatigue. Signs of fatigue are: (1) yawning, restlessness, fidgeting, headache; (2) pallor and flushing, bagginess under the eyes, lax condition of skin and hair; (3) emotionalism, and loss of control over features, limbs, etc.; (4) inattention, stupidity, and dullness occurring in excitable children, particularly those who have suffered from St. Vitus's Dance. Increased frequency of mistakes, or bad writing and spelling during the latter part of the day's work, is also very suggestive of fatigue.

Many of the symptoms of fatigue are regarded in school as moral failings, and thought to have no relation to physical conditions. Such a view is believed to be proved by the fact that by increased effort they can be controlled. The answer to this is that in such a case the teacher himself provides the extra effort which the child alone could not provide. It should also be remembered that moral qualities have a physical basis as well as intellectual and social ones, and that this physical basis is profoundly influenced by physical health, for when that is improved, and more rest is secured, we generally get improved behaviour.

Fatigue is the natural accompaniment of effort. It succeeds the first exultation of effort. Without fatigue, no progress is made. It is nature's warning that the energies, though not exhausted are diminishing. It tells us that steps should be taken to prevent it developing into exhaustion and to secure recuperation.

Chronic fatigue or debility is often due to the continued presence of some product of disease circulating in the blood, such as the blood poison which accompanies rheumatism, anaemia, St. Vitus's Dance, sore throats, absorption of decaying matter from teeth, chronic pharyngitis.

Cyclical Variations in Energy. The output of

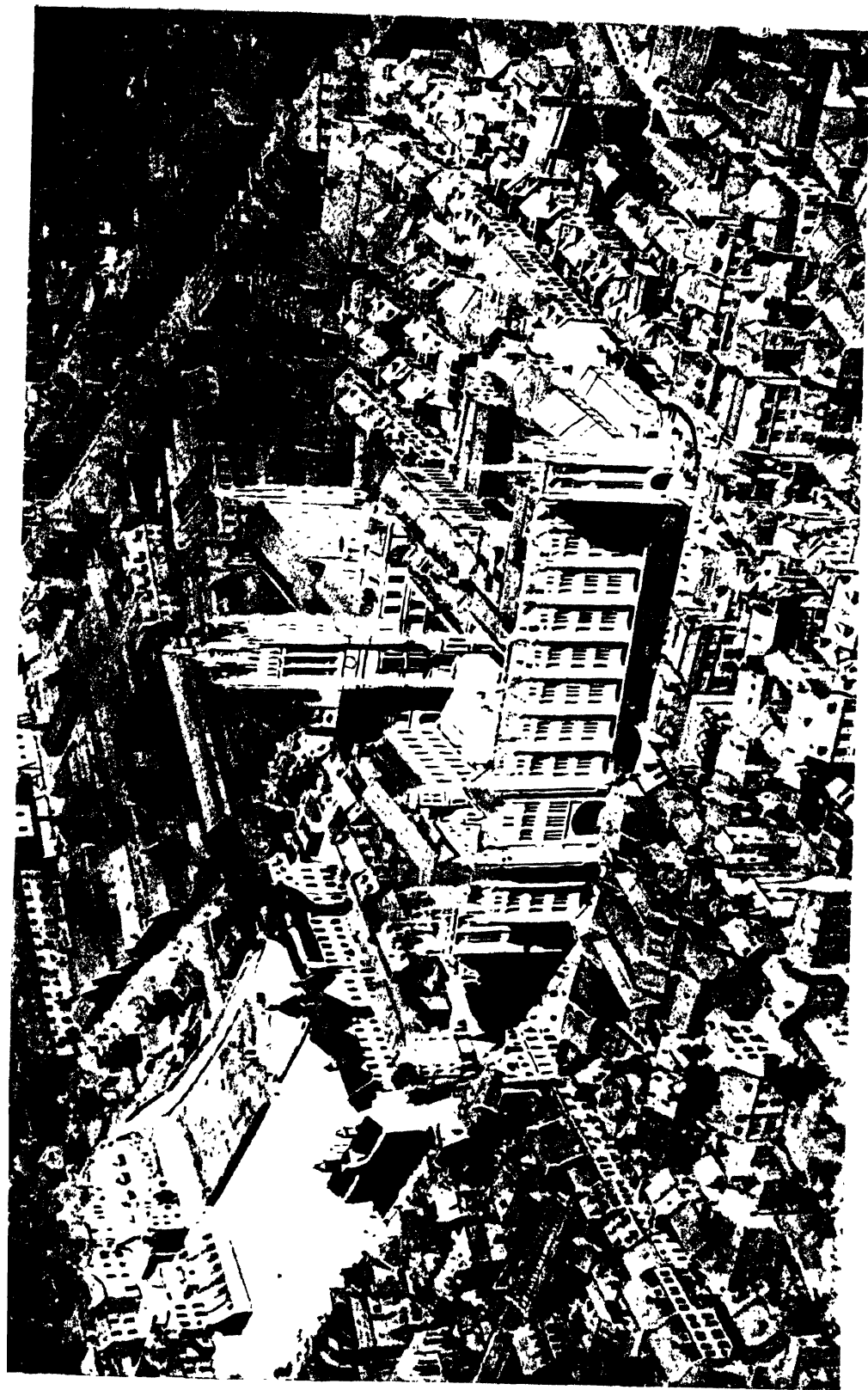


Photo by Aerial Photos, Ltd., Edinburgh

Air-Photo of Marischal College, Aberdeen

physical energy is not uniform, but rises and falls with the cyclical changes which occur in all organs of the body. In neurotic children (that is, delicate children with quick nerve response, but limited power of sustained effort and attention) the periodic diminution of output particularly affects the higher centres of the brain, and is manifested in lack of control, irritability, inattention, twitchings of face, and tremors, silly laughter or talkativeness. These are failings of energy rather than faults of moral purpose, for there is a close relationship between excitability, stupidity, and fatigue. Children with defective nerve force may be stupid or sullen, and appear morbidly restrained when they are really paralysed by confused emotionalism. Whether such children show a tendency to reverie, or are excitable and unrestrained, it is still due to lack of nerve power. In the one case, the nerve reactions, as shown in all forms of intellectual work, are slow and impaired; in the other case, they are erratic. A child may do a few sums well, or construe a few sentences perfectly, or may learn some piece of repetition at an early part of the day, which he is quite incapable of doing a couple of hours later. This adds very much to the difficulty of properly estimating whether a child has put forth adequate effort in doing his home work. He may be kept in after school, and by the personal influence of his master perform, under supervision, a piece of work which he is quite incapable of doing when he gets home and the external pressure is removed. If the work done under pressure be persisted in, rapid nerve exhaustion follows, and either a definitely nervous outburst occurs, or else some physical breakdown such as is manifested by a feverish attack, generally called a "cold."

Hence in the school training of adolescent children, we must avoid all rigid systems of estimating capacity according to years or to bodily growth. Adolescence is the period of a rapid increase of bodily and mental power. It may occur at 12 or be postponed to 15 or 16. It is generally delayed in the delicate child; but, under wise guidance, there may be no ultimate shortage, but even an exceptionally full measure. The increase of power can only be gauged by watching the actual results which are achieved. As in the case of the problem of physical prowess, we need not only a careful study of the facts, but careful preparation long beforehand, if we are to secure the proper results.

A. A. M.

ADOLESCENT, INFLUENCE OF ENVIRONMENT OF THE.—(See ENVIRONMENT AS EDUCATION)

ADULT EDUCATION, THE WORLD ASSOCIATION FOR (13 John Street, Adelphi, W.C.2).—This association was founded early in 1919 for the purpose of bringing together all those interested in Adult Education throughout the world. By the end of its first year it had a membership of individuals and supporting bodies representing twenty-six countries.

Its method is to work through a central Bureau of Information, publishing bulletins at regular intervals and on special matters. It appoints commissions for inquiry into, and experiments in connection with, problems of adult education. The most important of these is engaged in developing the possibilities of education amongst seamen afloat and ashore.

Another scheme undertaken by the association is the development of Crosby Hall, Chelsea, once the palace of Richard III, and the home at different times of many famous men, as a residence for students from overseas taking courses at university institutions in London.

The association is governed by a representative council, the first president of which is Thomas G. Masaryk, President of the Czecho-Slovak Republic. There are abundant signs that the association is meeting a world need, and that the result of its influence will be not merely the development of adult education in all countries but also the strengthening of mutual interests between nations.

With the help of the League of Nations a World Conference is to be held at Geneva in 1923.

A. MANSBRIDGE.

ADULT SCHOOL MOVEMENT, THE.—The purpose of the present Adult School Movement has been defined as being "to intensify the social spirit by associating men together for the free study of the deeper problems of life, viewed in relation to the ideal of manhood set before them in the Gospels." The movement had a humble origin in the desire to help "the working classes" to acquire some of the rudiments of education, at a time when vast numbers of them could neither read nor write; and, along with this, to impart some knowledge of the Bible. The founders of the first Sunday schools for adults were middle-class people, mainly connected with the Society of Friends; and, during the early days of the movement, its management was mostly in their hands. It has, however, been strikingly marked by the democratic spirit, and its working is now very generally controlled by the members themselves. The present adult school movement dates from about 1845, when Joseph Sturge, the well-known Quaker philanthropist, being impressed with the value of some Sunday classes for young men and women at Nottingham, carried on by one Samuel Fox—also a Quaker—set going the "Severn Street Adult School" for young men in Birmingham. A women's school was added in 1848. The teachers in both the men's and women's schools were almost all Quakers; but, in 1871, when nearly 2,000 members had been enrolled, an inter-denominational committee was appointed. By the end of the century, the number of members in Birmingham and its immediate neighbourhood was nearly 7,000, representing some 250 schools, affiliated to the Midland Adult School Union.

Educational and Social Activities. Men's Adult Schools usually meet on Sunday mornings; those for women on Sunday afternoons or on week-day afternoons or evenings. There are comparatively few "mixed" schools. Every genuine adult school develops a number of activities, which gather round the regular weekly meeting; and the growth of these in Birmingham may be taken as typical. First, a savings fund was begun for men, and was quickly followed by another for women. Then a library was opened, and temperance societies established. Still later a sick club was added. Branches began to be formed in various parts of the city, and in several cases were opened as clubs or institutes for the use of the members on week-nights. Nearly all adult schools undertake educational work in addition to the Sunday Bible study. After elementary education became compulsory, writing and reading grew less in demand; and the

place of these is now often taken by "first half-hour" lecturettes on social, historical, literary, or scientific subjects. Week-evening lectures are also common. In 1892, Severn Street became a centre for Oxford University Extension lectures, which were given there for many years. In many centres, classes are arranged in connection with the local Education Authority or with the Workers' Educational Association. In many districts, definite social work has been undertaken, including police-court work and efforts to reclaim criminals, to instruct mothers, to look after blind, deaf, and crippled children, and the like. A *Social Service Handbook*, issued in 1914, has been of great use in stimulating and guiding such efforts. At the same time, the more purely spiritual side of the work has not been neglected.

Organization and Development. When the adult schools were mainly Quaker undertakings, they were organized (together with a large number of children's schools) under the "Friends' First-day School Association"; but, when the movement spread into wider fields, an undenominational organization became necessary. County Unions were formed, which, in 1899, were united under the "National Adult School Union." An office was set up at 1 Central Buildings, Westminster, and has lately been removed to 30 Bloomsbury Street, W.C.1.

The National Council is elected by the county unions, the members of which are themselves freely chosen by the schools, so that the constitution is thoroughly democratic. Immense care is taken by the Council in preparing a scheme of lessons for the regular classes of the following year, which, though not in any way compulsory, is, in point of fact, used by nearly all the schools. The lessons are based on the Bible, and are so selected as to give variety of subjects while maintaining a high educational standard. A lesson handbook is prepared and published a year in advance, and has a very wide circulation. These classes differ from an ordinary Bible class chiefly in their democratic character. The "teacher" has now very generally given place to an elected "president," who feels it his place to draw out and guide the thoughts of the members, rather than to do all the instruction himself.

Of late years the movement has become an increasingly important factor in the adult education of England, though it has never made much headway in Scotland, Wales or Ireland. (See ADULTS, EDUCATION OF.) The "first half-hour" lecturettes are in many places being systematized into connected courses, with increased educational value. Week-end lecture schools are often held, short courses of lectures on religious or social subjects being given by University graduates and others. The demand for these is steadily increasing. In 1917 nearly 200 lecture schools were held, two full-time lecturers being engaged on the work. Summer schools, extending over one or two weeks, with courses of lectures and large opportunities for discussion, are held at attractive centres. In 1918 the number of these was 27, and some 650 men and women were in attendance.

More permanent educational work has also been undertaken. A small college for men, somewhat on the model of the Danish High Schools (*g.v.*), was opened in 1909 at Fircroft, Bournville, and re-opened after the war in the autumn of 1919. It is managed by a committee representing the Adult School Union

and the W.E.A., and provides religious and general education for about twenty resident students. Five non-residential settlements, with comprehensive courses of evening lectures, have been opened at Leeds, York, Lemington-on-Tyne, Birkenhead and London; and there are also five permanent "Guest Houses" in different parts of the country, which offer facilities for educational holidays. Local "Study Circles" are encouraged and assisted, and correspondence classes are carried on.

Literature. The output of literature is considerable. The monthly magazine *One and All* has a circulation of about 15,000. The annual Lesson Handbook (already alluded to) is one of the most helpful schemes of religious study extant. There is also a Young People's Lesson Handbook, with a different scheme of lessons for junior classes. Numerous study handbooks have been issued, as well as outline courses on social, historical and literary topics. The *Fellowship Hymn Book* has gone all over the world, with a sale of some 700,000 copies, and of the *Fellowship Song Book* about 80,000 have been sold. Recently the first of a series of "Little Plays," "Where Love is, God is," has been published and widely acted. A *Directory and Year Book* is issued, usually in the spring of each year.

In 1914 there were about 1,800 schools under the care of the National Council, grouped in 30 county or district unions, and with a membership of about 81,000, of whom 47,000 were men and 34,000 women. There are also about 5,000 adolescents grouped in boys' and girls' fellowships respectively.

Books. No adequate history of the Adult School Movement has yet been written. Much valuable information will be found in the "Final Report of the Adult Education Committee" presented to Parliament in 1919 (H.M. Stationery Office, 1s 9d.), especially on pages 10-12, 29, 31, 211-214, 224-227, and 233-235. Specimens of the study handbooks, etc., alluded to above may be obtained by application to the National Council.

E. GRUBB.

ADULT SCHOOLS.—(See ADULTS, EDUCATION OF.)

ADULTS, THE EDUCATION OF.—The natural homes of the education of adults are the universities, where, from time immemorial, study and research have been encouraged among the elder as well as the younger members of the same. The schools of mediaeval England are now known to have been much more numerous and efficient than was at one time supposed, but there is little or no evidence to show that the boys who attended them continued their education after school age, unless they went to the university or joined a religious order. In episcopal registers of the same period, there is frequent mention of licences being granted to secular clergy, enabling them to leave their cures for a year or more and reside in the universities. Provision was made in the rule of St. Benedict for monks to be occupied at fixed times in sacred reading, but such study had little influence on the non-monastic world outside the convent. In the thirteenth century, the newly-founded friars were the centre of a great revival of learning. They had settlements in all the great towns, and these were visited by a regular succession of lecturers, who brought the most recent learning within reach of their brethren. There

appears to be no proof that others were admitted to the lectures; but the friars were in closer touch with the people than the monks, so that some of the new learning must have been passed on to outsiders. In the century succeeding the Reformation, one of the chief names in the cause of higher education is that of William Dell, Master, in 1650, of Gonville and Caius College, Cambridge. He wished to see "universities or colleges, one at least, in every great town or city in the nation, as in London, York, Bristol, Exeter, Norwich, and the like," as well as in Oxford and Cambridge. In these, the youth should "spend some part of the day in learning or study, and the other part of the day in some lawful calling; or one day in study, and another in business, as necessity or occasion shall require." This is the earliest clear reference to the importance of education for those engaged in the ordinary occupations of life. The universities and colleges he had in mind were not founded till the nineteenth century in any of the great towns. Where such colleges cannot be built, the opportunity of higher education has been provided for all classes in hundreds of centres by the system of University Extension (*q.v.*) founded in 1873; and by University Tutorial Classes (*q.v.*), commenced in 1907 under the auspices of the Workers' Educational Association (*q.v.*). Adults have also been thought of by Oxford and Cambridge in their system of Higher Local Examinations.

Sunday Schools. Of a less advanced type was the teaching in Sunday schools (*q.v.*), but it is a mistake to suppose that such teaching was confined to children. The practice originated from the old custom of catechizing in church, when "servants and 'prentices" were also expected to attend. Adults were taking advantage of the Sunday school system before the close of the eighteenth century, and large numbers of adults still attend Sunday schools in Wales. The same country saw the rise, on a large scale, before the middle of the eighteenth century, of day and night schools, attended by persons of all ages. The schools were established by Griffith Jones, of Llanddowror, and were the parents of the Adult Schools (*q.v.*). Night schools and evening classes first received Government aid in 1851, and have since been carried on in large numbers.

Literary and Philosophical Societies, and Mechanics' Institutes. Two classes of local institutions, which, from the beginning, have catered almost entirely for adult students, are the Literary and Philosophical Societies, and the Mechanics' Institutes. "The Lit. and Phil.," as it is generally called, was founded at Manchester in 1781, and at Newcastle-upon-Tyne in 1793. In these and other large towns, a great service has been rendered by such societies to education in Science, History, Literature, and Art. As a rule, membership has been mainly sought by the professional and commercial classes; but, early in the nineteenth century, the needs of working men were considered in the foundation of Mechanics' Institutes. The idea came from Scotland, but was developed most in England, where, in 1850, there were more than six hundred such institutes: the movement was a comparative failure in Ireland and Wales. Often there was no attempt to supplement the lectures there given with class teaching, and the lack of a sound elementary education prevented all but a small minority from profiting greatly by the opportunities offered. The tradesman rather than the

working man was attracted; and most of the old Mechanics' Institutes have disappeared, or been transformed in character. There can be no question, however, that the movement prepared the way for the systematic technical instruction which became so marked a feature of the closing years of the nineteenth century. The single lecture may be of little value in itself, but it has started on a course of study many thousands of persons, whether under the Royal Society of Arts (*q.v.*), in connection with local institutions, or under the Gilchrist Educational Trust (*q.v.*).

Modern Developments. In early Victorian times, many earnest men were dissatisfied with the comparatively narrow ideal of the Mechanics' Institutes. The People's College at Sheffield, founded by the Rev. R. S. Bayley in 1842, was the precursor of the much more famous Working Men's College in London (*q.v.*). Similar colleges have been founded at Liverpool, Leicester, and elsewhere; while Ruskin College (*q.v.*) at Oxford has the same ideal. University Settlements (*q.v.*) are a part of the same movement. From the early days of Co-operative Societies, a considerable sum of money has been spent on general education, in addition to the classes in the principles of co-operation, which are naturally deemed to be of high importance. The education of adults has been greatly assisted in recent years by the increase of free libraries and museums. It is, however, not generally recognized that the provision of such tools is not sufficient without instruction as to their use. Skilled guides and lecturers are now provided at the National Gallery and some of the chief museums; but the library is not, as a rule, linked definitely to the lecture-hall and the class-room. Many librarians, however, are both able and willing to give skilled advice to readers, and great assistance is given to many students by the National Home Reading Union (*q.v.*). Educational movements, up till recent times, have been mainly concerned with men, but there is an increasing tendency for women to be included. In the latest efforts for higher education, such as University Extension and Tutorial Classes, men and women are placed on an equal footing. In some cases, the lecturers are women. Both men and women attend the summer meetings and schools provided by the universities and other bodies. Such meetings have not attracted the overwhelming numbers which assemble at Chautauqua and other places in America, but they are increasingly found to be a valuable means of obtaining special information, of stimulating enthusiasm, and of promoting goodwill between persons of different classes and nationalities. The Women's Institute movement, which is Canadian in origin, has made great strides in the last few years, and seems destined to have a great influence on adult education in rural districts. "Triangle" clubs for men and women are being started by the Y.M.C.A., the Y.W.C.A., or by both jointly. Non-vocational institutes were founded by the London County Council in 1913. "Settlements," both residential and non-residential, have increased in number, and do considerable educational work. Trades Unions are frequently affiliated to the Workers' Educational Association, and they are the mainstay of Ruskin College and the Labour College.

The Movement towards National Education. Half a century of compulsory elementary instruction has greatly affected the prospects of adult

education, with which the State is more and more concerned. The Technical Instruction Acts of 1890 and 1891 gave power to local authorities to subsidize the teaching of many subjects which were not technical in a narrow sense. The Education Act of 1902 swept away all restrictions, and, as a consequence, humanistic study has been more and more encouraged. The Education Act of 1918 speaks for the first time of a "national system of public education available for all persons capable of profiting thereby." It provides a system of continuation schools for young persons up to the age of 18, which is bound to have an even greater influence on adult education than the provisions for elementary teaching in the Act of 1870. Not only so, but it contemplates the provision of higher education for adults, as is made clear by the draft suggestions for the arrangement of schemes under the Act, issued by the Board of Education. It is hoped that a new era has dawned of cordial co-operation for adults, as well as children, between the local authorities and the Board. The "bread-and-butter" theory of education is increasingly discarded, and provision is being made for art, craftsmanship, and music, as well as the other subjects of a liberal education. Lectures and classes for adults can only with difficulty be made self-supporting, and any weakness in the systems of the last half century can generally be traced directly to this fact. The problem of the future is to combine the energy and enthusiasm of the old voluntary movements with the financial stability which State assistance can supply.

Effect of the War on Adult Education. The war of 1914-1919 is another factor which has emphasized the value of education, higher as well as elementary, adult as well as juvenile. The problems calling for settlement were new to the vast majority of people, and it was seen that accurate knowledge and careful training were of vital importance. Educational work was undertaken in the Army, at first by the Young Men's Christian Association through its Universities' Committee, and then under official authority. Many thousands, almost for the first time, had their intellectual interests aroused. Adult education was carried on with great difficulty under war conditions, but in many cases more interest than ever was shown. There has recently been a great development of one-year classes in connection with the Workers' Educational Association and other bodies. They are not usually under university control, but they are planned on similar lines to the three-years' Tutorial Classes. In July, 1917, a committee was appointed under the Ministry of Reconstruction to consider the question of adult education. Their final report, issued in the autumn of 1919, surveys the whole field and makes recommendations as to scope, management, and finance. It regards adult education as of such importance that it recommends State help for it even when the particular organ of education is avowedly partisan and propagandist. It emphasizes what may be regarded as the central principle of adult education, that, although taxpayers have a claim for themselves as well as for their children, State control in detail is impossible. The solution recommended is that the State, whether local or central, shall hold out a helping hand to voluntary bodies—religious, political, social—as well as wholly educational. Such bodies can enlist the sympathy of their members in a manner which is quite impossible for a State

department. Adult education is still touching only the fringe of the population, but recent movements encourage the hope that in the next generation it may be common rather than rare for the citizen's education to be continued all through life. Such a consummation is greatly to be desired, for the sake of the State as much as for the benefit of the individual. Mr. Lloyd George's ideal of "a community of educated citizens" will then be within sight.

D. H. S. C.

ADVOCATES' LIBRARY, THE.—(See **LIBRARIES** IN THE EIGHTEENTH CENTURY.)

AEGROTAT.—A Latin term meaning "he is ill," used in the examination lists of the Universities of Oxford and Cambridge to indicate that a degree has been presented to a candidate prevented by illness from completing his examination. The degree is awarded if papers already written by the candidate reach the required standard.

AELFRIC, ABBOT (Grammaticus).—Born in the tenth century, he has by some been identified with Aelfric, Archbishop of Canterbury, who died in 1005, and by others with Aelfric, Archbishop of York, who died in 1051. All that can be said with certainty is gathered from the writings of Aelfric, who always describes himself as "Abbot," and whose chief works were written about 1000-1015. He was educated by a secular priest, whose ignorance of Latin much impressed Aelfric, and he writes: "There was no one who could write or understand Latin letters till Dunstan and Aethelwold revived learning." He became a pupil of Aethelwold, Abbot of Abingdon. When Aethelwold, in 963, became Bishop of Winchester, he expelled the secular clergy and sent to Abingdon for monks to take their places. Among these monks was Aelfric, who is next heard of at Winchester as a monk and Mass priest.

Aelfric became abbot of a new monastery at Cerne in Dorsetshire, and, later, Abbot of Evesham (1005). Aelfric's writings consist very largely of translations and compilations, and include school books, which show his deep interest in education and his sympathy with the prevailing spirit of monastic revival of the time. The following are some of the most important of Aelfric's works still extant—

Homilies, two books of forty sermons each, translated from Latin sermons then used in church. Aelfric said that there was little Gospel light for those who could not read Latin except in books translated by Alfred. The Homily "On the Sacrifice" was re-published in 1566 as *A Testimonie of Antiquite*, in support of the doctrinal reformation then proceeding under Elizabeth. *Sermons for Saints' Days*, edited by Professor Skeat, were published by the Early English Text Society in 1881. *Treatise on the Old and New Testaments*. *Heptateuchus*, a translation of the first seven books of the Old Testament, with the Book of Job. *Life of Aethelwold, Abbot and Bishop*. *Canons*, rules on the duties of priests, written for Wulfsey, Bishop of Sherborne. *A Latin Grammar* for school-boys. (On account of writing and teaching grammar, Aelfric has been surnamed "Grammaticus.") *Colloquium*, a reading book for learners to help them in the correct speaking of Latin. This book is in the form of a dialogue between Aelfric and one of his pupils, and contains interesting and instructive

descriptions of the daily lives and occupations of men of Aelfric's day.

AENEAS SILVIUS.—Aeneo Silvio de Piccolomini was born in Italy in 1405. He became an elegant Latin scholar and a good poet, and was appointed secretary to the Bishop of Fermo, and accompanied the latter to the Council of Basle in 1432 and, later, visited Scotland with the Papal legate. He was for some years secretary to Pope Felix V at Rome, and then to Frederick III at Frankfort. Under Pope Calixtus III, he was made Cardinal, and succeeded him as Pius II. One great aim of his policy as Pope was to unite all the Christian nations against the Turks. He died in 1464.

Aeneas Silvius left numerous writings, including valuable historical and geographical works. He had excellent talents, which he had diligently cultivated early in life, but personally he was selfish and self-seeking. He visited many capitals, gaining a large experience of men and places. His writings are valuable as histories of certain times and places; but, although of versatile genius, he did nothing to inspire admiration or regard.

AESOPUS.—Commonly known as Aesop, and generally thought of as the author of the celebrated fables, he lived in the middle of the sixth century before Christ. Herodotus, in 570 B.C., mentions a fellow-slave of Aesop, and it is generally supposed that Aesop died about 564. He was most probably a native of Phrygia, and became a freed slave. He visited the wealthy Croesus, King of Lydia, and, having gained his favour, was entrusted with several missions. On one he visited Delphi and roused the anger of the priests by his witty speeches. These speeches were considered blasphemous, and he was thrown over a cliff and killed. The Athenians caused Lysippus to erect a statue to his memory.

Aesop, as far as is known, left no written works. The only Greek version is that of Babrius, a writer of fables in the early years of the Christian Era. Babrius made a collection of fables of the same class as those of Aesop, and turned them into a popular style of verse. Aristophanes mentions the fables as very popular in his day, but represents one of his characters as learning them by conversation—not from a book. Socrates turned such of them as he could remember into verse. The fables now bearing Aesop's name are unquestionably spurious, rather Aesopean than Aesop's. Only a few of those versified by Babrius are now preserved. Many of the so-called Aesop's fables are of Eastern origin, and include references to Asiatic customs and names of Asiatic animals, such as the panther, the peacock, and the monkey. The source is probably Indo-Persian, like that of the fables of the famous Arabian Lukman, who was a contemporary of David or Job. There are three principal collections from which the present fables are derived. A collection of 136 fables from manuscripts at Heidelberg was published in 1610, and was obviously a forgery, for they contain a reference to Demades, who lived 200 years after Aesop, and a whole sentence in Greek from the Book of Job. Another collectio was made in the fourteenth century by a monk of Constantinople: this contains many Hebrew passages. A third collection was published in 1809 from manuscripts at Florence belonging to the thirteenth century.

AESOP'S FABLES.—(See MORALS AND MANNERS, HISTORY OF THE TEACHING OF.)

AESTHESIOMETER.—An apparatus used for measuring the distance between two points on the skin recognizable by the nerves of touch as being distinct. The points of a pair of compasses may be used, and it is found that the smallest distances occur on the tips of the fingers, where points less than a thirtieth of an inch apart can be distinguished as separate.

AESTHESIOMETER, THE.—(See PSYCHOLOGY (EXPERIMENTAL).)

AESTHETICS AND EDUCATION.—The idea of aesthetic education suggests no particular philosophical problem, unless the beautiful is recognized to be a fundamental, original manifestation of the mind, distinct from all the rest.

Aesthetic Heresies. Clearly, if beauty is regarded merely as a case or class of the agreeable, or of that which contributes to individual comfort and happiness, its bearing on education will not differ essentially from the relation existing between education and the agreeable (or, to speak more correctly, the useful in general), and aesthetic education will simply form a branch of economic education (physical, hygienic, dietetic, sexual, etc.). Similarly, if beauty is considered to be a moral or virtuous attitude of the soul (e.g., inward harmony, temperance, or refinement), then aesthetic education will be but a branch of ethical education. Again, if beauty is regarded as a symbol of truth, as an ideal form of logical or historical knowledge, or as an ornament or allurements towards truth, then its treatment will come under logical and scientific education, and this alone can decide whether the educative process shall admit or resist the claims of beauty; and, if the former, how and within what limitation. In all these cases, a philosophical treatment of the problem of aesthetic education is out of the question, empirical treatment alone being possible; that is, beauty being in them reduced to a simple conception of class (an empirically-constituted group of hedonistic, moral, or intellectual facts), nothing can be said of its primary, peculiar functions, the existence of which is virtually denied by the adoption of any such conception. None but empirical precepts can be laid down concerning the various diversions, exercises, or expedients, known as aesthetic, and their appropriateness to the age of the pupil, and to the type of education. Nay, indeed, since beauty and art thus lose their inevitability, becoming mere limited determinations in a general whole, one may even, as already mentioned, resist them, or try to destroy them or reduce them to a minimum. Thus, the educator, whose object is a physiologically healthy and utilitarian life, will condemn all lingering among the delights of the imagination; the rigid or ascetic moralist will object to the softness and sensuality engendered by the cult of beauty; the logician and man of science will disapprove of fables, which are the enemies of truth and more likely to weaken the mind and lead it astray than prepare it to receive the truths that suitable stories embody. Attempts to displace the quest of beauty have been made, as may be remembered, though, in truth, the expulsion of art from well-ordered republics, the war against beauty in the name of austere ethics, the derision of fancy in the name of intellect, belong

rather to the story of pedagogical Utopias than to that of actual education and custom. For aesthetic education has always advanced unaided, even when opposed; whenever it has found one way blocked, it has taken another, and asserted itself even in those who rejected it.

The Nature of Beauty. The reason for this is that beauty or art is a fundamental, essential, and eternal function of the human mind; irreducible to any other form, being elemental; ineradicable without the destruction of all the rest whose existence it implies, being itself implied by them. Art is nothing but fancy, and what we call *beauty* is nothing but fancy rejoicing in itself—the essence of fancy; and since genuine fancy springs from our sentiments alone (our aspirations, inclinations, rebellions, affections, aversions, etc.), art may be defined as the reflected form of sentiment. In fancy, sentiments become mental images, life becomes contemplation, and the passionate impulse (which in itself is mute) finds expression: in a word, sentiment changes into consciousness—not, it is true, into logical and historical consciousness, but rather into the spontaneous and immediate consciousness of intuition. This is the nature of art, and this its proper and indispensable function in the life of the mind; and it follows that it is, in truth, a preparation for the logical life of thought, or philosophy; it is not, indeed, as was once believed, a sort of inferior, popular, imaginative philosophy, but, rather, non-philosophical knowledge—the world of mental images which philosophy will penetrate, differentiate, and arrange, transforming it into the world of reality and history. And since fancy and art are essential elements of the reflective life upon which activity is based, the practical and moral importance of art may clearly be said to show itself not, as was once thought, as a display of the action of examples, precepts, and utilitarian and moral stimuli, but rather in the fact that Art, while in no sense determining the mind, renders possible, by merely presenting human sentiments and passions as a spectacle, the further determination of perception and moral duty.

The Expression. Clear expression (which is tantamount to clear inward vision before statement) is art, poetry, speech, writing, drawing, music; and, since this knowledge-expression is of essential importance to the mind, it is also a necessary part of education, which should and does strive for the development of every individual as an artist. For the word "artist," before indicating certain particular individuals or classes of individuals—so called because they possess the power of fancy and expression to an exalted degree, and are able to elaborate vast, difficult, and rare expressions, described in the strictest sense as "works of art"—signifies *man himself*: any man whatever, who is an artist because of his humanity. He is an artist even if his artistry consists in nothing more than ability to talk well of everyday life, and to give correct expression to his most simple and obvious sentiments; and the mother and nurse train the child for art, or expression, before the professional master. And this education is continued and extended until it reaches the highest and most complex forms of oratory, drama, painting, sculpture and music, which are all nothing but the expression of the soul of the artist—the words used by man not only in ordinary, but also in extraordinary and solemn moments. However great the artist, however intense his work, he will never derive from it

any real, direct satisfaction except that of seeing his sentiment fully and clearly enfolded and outlined in word, rhythm, or line.

If this, which may be called the "productive" side of aesthetic education, is all, as it were, narrowed down to the "learning to speak" of the baby, or the "learning to write" of the child, the other side, generally called the "reproductive," is all represented in "learning to read." For reading, real reading, reading with one's whole soul, is to reproduce in oneself the picture palpitating with life, which the writer had in mind while putting his signs on the paper, and to feel equally with him the joy of beauty; and if the writer had nothing in his imagination, or only a faint, confused image, and his writing is a barren and vain effort, this poverty of spirit will be reproduced in us also, and we shall feel artistic displeasure (or the sentiment of the ugly). "Learning to read," in its broadest sense, embraces not only the modest explanation usually supplied by the teacher, but also the education of the philologist and connoisseur, the study of languages and forms of speech, experience of life: everything, in fact, which is required to comprehend the words of others, and works of art both past and present. But when we speak of the "words of others" and reproduction, we are simply recognizing conventional distinctions: what belongs to "others" is really our own; what we call "ours," belongs to others; for the individual does not exist as a mere abstract individual: he is a social being, a part of humanity and of the history of humanity; and his *reproduction* is *production*, for what he reproduces belongs to him as man, and is his, beyond time and space, now and for ever. Thus aesthetic education, whether called productive or reproductive, like every other form of human thought and work, like every other activity, raises the individual to humanity and makes him a collaborator in the authorship of actual history.

Art and Education. This briefly outlined conception of the beautiful determines the relation between art and education. All questions hitherto raised, and all that may be raised in this connection, find solution in the nature of art, which alone regulates aesthetic education. But if the relation between art and education is thus made quite definite, the same cannot be said of that between *Aesthetic* and *Pedagogy*, which have always been regarded as *two distinct sciences*. Thus has it always been in scholastic conceptions, as well as in a celebrated pedagogical school which retains much of the scholastic—the Herbartian school—in which, on the one hand, was placed a science of spiritual values, viz., Aesthetic sub-divided into Ethic and Aesthetic in the narrow sense; and, on the other, a science of psychical facts, or Psychology; and Pedagogy was the science which studied the application of the values to the facts and the modelling of the facts according to the ideas. To this conception it may be objected that we are not shown in any way how the human psyche can ever receive into itself that which it does not already contain, and which is, consequently, extraneous to it; and that a theory of application *ab extra*, instead of being a matter of education, seems rather referable to material dexterity, and would explain, at best, *not* spiritual life—the flame that feeds the flame—but that distortion of it universally condemned as parrot-like, mechanical, pedantic imitation. The truth is that education is development; spontaneous like every form of development; and the educator himself can

only accomplish his work as educator in so far as he identifies himself with his pupil, making himself one with him; for, in education also, it is not the abstract, isolated individual who is developing, but concrete, universal humanity. If this conception of education, which the modern Italian school of philosophical pedagogy has the credit of having introduced and maintained, is unassailable, the fact, or rather the act, must inevitably correspond with the essence or idea—the psyche with the mind—and the *theory of education* with the *philosophy of the mind*, which deals with the never-ceasing development of the mind, in its constant diversity from moment to moment, and unfailing unity in diversity itself. Now, fancy or art represents one of these moments, in which the mind separates itself in order to obtain unification; and that part of the philosophy of the mind which takes it as a study is known as Aesthetic. Therefore, the theory of aesthetic education cannot be included under the heading of a non-existent pedagogical science, but is identified with Aesthetic, the two being identical both as regards the problem and its solution; that is, the conception of art is identical with that of the genesis and development of art—the conception of the artistic mind with that of the education of the artistic mind—which is the unfolding of the nature of that mind.

Pedagogy and Aesthetic. Indeed, there is no question which can be presented under the form of a pedagogical question appertaining to art which, if understood rationally, cannot be resolved into a question of Aesthetic. "What position has art in education?" This question, as we have already seen, is identical with that regarding the nature of art and its function in the life of the mind, which is the general question to which Aesthetic gives the reply. "Is it better in teaching language and composition to give the preference to reading or to grammar?" This question is reducible to another, namely, whether the precepts of art originate before or after art; and Aesthetic, in dealing with this, shows that precepts and the grammatical rules containing them are systems evolved from art already produced, and, as systems, have no value apart from the things which they summarize; and, as rules, are always abstract and can never be substitutes for genius or taste, which alone are decisive factors. "Is it desirable to confine the pupils strictly to classical works or to incite them to new, personal achievements?" Aesthetic proves that true art is always new and personal, but that the new and personal can only grow on the soil of history, the present having its roots in the past, so that the study of classic art and the encouragement of the new are not two contradictory requirements, but one and the same; sincere and serious spontaneity is, at the same time, discipline.

It may seem that, at any rate, there remains to Pedagogy, as its peculiar domain, that aggregation of rules known as empirical, which, indeed, represent the generalized experience of teachers belonging to various times and places with regard to the good and bad effects of certain practices: with regard, for instance, to the methods of correcting an excess of fancy by means of criticism, or excessive critical tendencies by invigorating the fancy; or with regard to the improprieties of, and remedies for, the excessive cult of beauty, which encourages minds to dream and makes them inert or perplexed in action; or again, coming down to details, with regard to the age at which it is suitable for certain sorts of

poetry or novels to be read, or for the pupils to be taken to public galleries and museums, or to direct them to the study of modern foreign literatures, and so forth. But, granting that, it has to be acknowledged, both on the part of him who asks and on the part of him who concedes, that *Pedagogy as a philosophical science has no reality save as philosophy of the mind* and, in relation to artistic education, as Aesthetic; and that, understood in any other way, it is not a philosophical or rational science, but an empirical science, or rather pseudoscience. And it is peculiar to the empirical sciences, and to the aggregation of their dicta, that they are just as useful as guides and indicators as they are unsuitable for the purposes of reasoning and drawing conclusions, which always require, in place of science, a reference from those dicta to the philosophy of the mind: in this instance, to Aesthetic; just as, to do practical work as an educator in the single cases given, it is necessary to deal intuitively and directly with the single case, illuminating it with rational knowledge: in which, that is, in practical individualization, are to be found, as every one knows, the efficacy and excellence of the educator.

B. C.

AFFLICTED CHILDREN, TEACHERS OF.—

Blind children are technically defined, for school purposes, as those children whose sight is too weak for them to be able, even with the aid of glasses, to use the ordinary school books and apparatus.

The Teacher of Blind Children must, therefore, be able to dispense with the ordinary apparatus, such as the blackboard, pictures, and maps. He must have special technical knowledge of Braille reading and writing, and his special training must include knowledge of blind children.

The Board of Education refuses to recognize permanently, either as head or as assistant teachers, men or women who have not "had adequate experience in a school for blind children," or who have not passed "an examination approved by the Board in the methods of teaching in schools for blind children." Teachers must be either "certificated" or "uncertificated."

There are certain difficulties, in addition to the blindness of the pupils, with which a teacher of the blind has to cope. With the younger and recently admitted children, he has, in too many cases, to deal with the result of congenital mental deficiency, or of parental neglect. Blindness and mental deficiency are by no means necessarily found in the same person. But, with children, the two afflictions are not infrequently two signs of an abnormal nervous constitution, or of undue parental ignorance and callousness. The first work is to teach a pupil to dress and wash himself, to use a spoon, and generally to overcome his helplessness. The older pupils have to learn a trade. A teacher of blind children must, therefore, be something of a craftsman.

The regulations for special schools in England and Wales restrict the size of a class of blind children to fifteen pupils in average attendance. This is much less than the size of a class of normal children in a public elementary school. From the teacher's point of view, the smaller class does not mean less work or less responsibility, blind children usually need far more individual care and assistance than normal children.

An assistant teacher is paid a salary rather greater than that of a similarly qualified teacher in a public

elementary school. The prospects of promotion to a head teachership are, however, much less.

A teacher is not bound to stay for the whole of his or her professional life in a special school for the blind. His interests, indeed, are safeguarded by an explicit statement of the Board of Education that "the withdrawal of the approval of any teacher as a teacher in a special school will not of itself affect that teacher's qualification as a teacher in an ordinary public elementary school."

Teacher of Deaf Children. The statements about teachers of blind children apply, *mutandis mutatis*, to teachers of deaf children. The principal differences are that deaf people have modes of communication (viz., lip-reading and finger spelling) not available for blind people; and that a class of deaf children should not contain more than ten pupils in average attendance.

Teacher of Defective or Epileptic Children. Special schools for physically defective, mentally defective, or epileptic children are managed in accordance with special regulations. So far as the teachers are concerned, these embody the same principles as have been mentioned in the two preceding sections, in regard to training (for teaching mentally defective children only) and qualifications. There is an additional regulation to the effect that "no person under the age of 20 years may be approved as a teacher of defective or epileptic children without express sanction of the Board."

As with blind and deaf children, each class in a special school for defective or epileptic children must have a teacher of its own. The number of children in average attendance in each class is limited to twenty, unless there are more than two classes in the school, when the number of children in average attendance may be twenty-five for each class above the two lowest.

Physically defective children must be in a separate school from mentally defective children, but epileptic children may be grouped with either. The Board's Regulations seem to indicate a preference for grouping epileptic with physically defective children. In practice, epileptic children are often mentally defective, and are treated accordingly. The reason for mentioning this separation of physically from mentally defectives is that the Regulations allow the two schools, when adjacent, to be under the same head teacher.

A. C. C.

AFTER-CARE ASSOCIATION, THE.—This Association, which for many years was the only one of its kind in the United Kingdom, was established for the assistance of poor persons discharged, as recovered, from asylums for the insane. It was formed, in 1879, by the late Rev. Henry Hawkins, who was for many years Chaplain of the Colney Hatch Asylum.

The chief object of the Association is to secure re-admission into social life for poor persons discharged from the asylums. This it endeavours to carry out in various ways. Friendly visits are paid to the persons, who are assured of sympathy, and may obtain advice if desired, while members of the Association keep in touch with them as long as needed. Some are boarded out for a few weeks in suitable country homes; others are placed in institutions in London and other large towns until work can be found for them. Every effort is made to obtain work suitable for each person; and grants

of money and clothes are given to help them while seeking for work.

The fact that the many convalescent homes on the list of the Charity Organization Society are, without exception, closed against persons recovering from mental derangement places the work of the After-Care Association in a very special position.

Since 1886 upwards of six thousand cases have been considered by the Council; and a very large number require "after-care" in many ways, even when suitably re-started in a new sphere of work. It is estimated that over 7,000 patients are discharged annually as recovered from our asylums; but the yearly average number of applications to the Society is now only about three hundred and eighty, half of which come from London. Local branches have been formed around London and in most of the counties and chief cities in England, and the Society estimates that the number of cases requiring such help as it gives must be at least fifteen hundred a year.

The Association is under royal patronage, and membership is obtained by subscription or donation.

The offices are at Church House, Dean's Yard, Westminster, S.W.1.

AFTER-CARE OF MENTAL DEFECTIVES.—(See MENTAL DEFECTIVES, AFTER-CARE OF.)

AFTER-IMAGE.—After rays of very bright light have fallen upon the retina of the eye, and the eye is closed or turned from the source of light, an image of the light can still be observed, though of a different colour. This is an after-image. If a white light has been looked at, the after-image is at first bright, then very dark, and afterwards of changing colour and intensity until it disappears. The explanation of this phenomenon is that the processes set up by the violent action of the rays of light continue after the cause has been removed. If a coloured light produces an after-image, the latter will be found of a colour complementary to that of the light.

AFTER-IMAGE.—(See COLOUR VISION, THEORIES OF.)

AGASSIZ, JEAN LOUIS RUDOLPHE.—Born at Motier, in Switzerland, in 1807, he studied at Lausanne, Zurich, Heidelberg, and Munich, devoting special attention to medicine, natural science, and comparative anatomy. In 1826 he edited Spix's description of the fishes of Brazil, and compiled a new classification of fishes. In 1839 he published his *Natural History of the Fishes of Europe*. He spent some years studying the alpine glaciers; and, in 1840, having established an observatory on those mountains, was able to advance new geological theories in his lectures on the "Plan of the Creation." In 1848 he became Professor of Natural History at Harvard University, and made scientific expeditions to Lake Superior, publishing the results in *A Tour of Lake Superior*. He died, in 1873, worn out by incessant work.

AGENCIES, TEACHERS' EMPLOYMENT.—For many years the appointment of teachers in higher schools has been carried on through the medium of agencies conducted on business lines for the personal profit of the managers. The agencies were the means of introducing principals requiring assistants to teachers seeking appointments, of providing

parents with suitable schools or private tutors for their children, and of negotiating transfers and sales of schools or partnerships between principals. The charges to teachers seeking employment have usually been 5 per cent. of the first year's salary in the case of permanent appointments; and 10 per cent. of the fees received by the teacher for part-time, temporary, or visiting engagements. The charges were always considered excessive by teachers, and in recent years an Appointments Committee has been established, under the auspices of the authorities, at several of the universities. These committees deal with posts of all kinds open to the graduates of the universities to which they are attached. The fees are very moderate: 5s. a year being charged at London and Cambridge, while the Manchester University Appointments Register charges only a shilling a year for registration. Such Appointments Committees exist in connection with the Universities of Oxford, Cambridge, London, Manchester, Liverpool, Edinburgh, and Glasgow; while Wales has an Appointments Board for university graduates.

AGNOSIA.—A form of Aphasia, rendering the sufferer incapable of understanding speech.

AGRAM, UNIVERSITY OF.—This was established in 1874 in Croatia, Hungary. The language of instruction is Croatian, and law the principal faculty. Other faculties are philosophy, natural science and mathematics; there are also schools of forestry and pharmacy. The library contains upwards of a hundred thousand volumes and numerous manuscripts. In normal times, the number of students is about a thousand.

AGRAPHIA.—A disorder of the brain, which renders the sufferer incapable of expressing ideas in writing.

AGRICOLA, RUDOLPHUS.—His family name was Husmann, and he was born in 1442 near Groningen, in Friesland. After being educated at Louvain, he proceeded to Italy to study ancient literature, and at Ferrara taught Latin and studied Greek. On his return north, he settled at Heidelberg (1482), wrote and lectured on ancient theology, and learned Hebrew.

Alexander Hegius, the first teacher of Erasmus, was one of Agricola's pupils. Erasmus was a great admirer of Agricola on account of his great learning and the extensive library of ancient literature which he had collected. Agricola's chief work was *De Inventione Dialectica* in three books, which he published in 1485, the year of his death.

AGRICULTURAL EDUCATION.—As early as the first century, we find thinking men impressed by the need for promoting education in agriculture. The Latin writer Columella says: "Husbandry alone, which without all doubt is next to and, as it were, akin to Wisdom, is in want of masters and scholars." But although the subject of agriculture received some attention from writers in the Middle Ages, it was not until the advance of experimental science in the seventeenth and eighteenth centuries that the idea of instituting regular teaching in agriculture, or in the sciences bearing on agriculture, took any definite shape.

Before the manufacturing industries usurped

attention, interest in the improvement of agriculture was widespread. It was recognized as the paramount and the most dignified of all industries, worthy of the attention of every man. Discussion of agricultural problems was a feature of the early days of the Royal Society, and was an element in the foundation of those Societies of "Improvers" in agriculture to whom the pre-eminence of this country in agriculture during the greater part of the eighteenth and nineteenth centuries was due. In these early days, however, it cannot be said that husbandry owed anything to scientific knowledge; and only a scientific tinge was given to the attack on the problems of agriculture by a certain amount of experimentation with methods of tillage and rotation of crops.

The advantage of careful tillage came to be recognized in this country as the result of the experiments of Jethro Tull, described in *Horse-hoeing Husbandry* (1730). About the same time, "Turnip Townshend" took up agriculture in Norfolk, and his system laid the foundation of an advance in British practice that gave it a pre-eminence which it enjoyed until the end of the nineteenth century. A tribute must be paid to early writers for the persistency with which they pressed the claims of agriculture as a subject worthy of serious study, and it is of interest to recall that the revival which took place in the eighteenth century was largely supported by the landowning class.

The Eighteenth and Nineteenth Centuries. Growth of interest in the eighteenth century in the practice of agriculture eventually led to an endeavour to introduce systematic teaching. Thus, in 1790, Chairs of Agriculture were endowed in the universities of Edinburgh and Aberdeen. In the former, a professorship was established; in the latter, a lectureship; but in neither case was the systematic teaching of undergraduates undertaken until nearly a century later. On the Continent we find that the movement bore similar fruit. Thus, in France, the first agricultural school was opened in 1763. In Germany, the beginnings were in 1722, when Frederick the Great established a Dairy School in Brandenburg. In 1790, the first Chair of Agriculture in Germany was established at the University of Rostock. In 1796, the Sibthorpe Professorship of Rural Economy was founded in the University of Oxford, but up to 1884 it remained amalgamated with the Chair of Botany.

The source of weakness in these opening movements is apparent. There was no scientific foundation of agricultural learning and, consequently, nothing to teach but crystallized empiric knowledge. Under these circumstances, the school or university had no advantage over the farm itself. Early in the nineteenth century, however, the science of plant growth took root. The fundamental researches of De Saussure in 1804, which for the first time established the rôle of the atmosphere in plant nutrition and identified the nature of the contributions made by the soil, were the starting point. In this country, the first scientific work on agriculture was done by Sir Humphry Davy, who, in 1813, published a number of lectures on the chemistry of agriculture, which did much to attract the attention of scientific men to the question.

But the epoch-making event which laid the foundation of modern science in relation to agriculture was Liebig's Report on Organic Chemistry, presented to the British Association in 1840.

The practical outcome of this report was the exploitation of artificial manuring, of which the pioneer was Sir John Lawes of Rothamsted, who introduced the use of superphosphates. This brings us to the establishment of the first college devoted entirely to technical instruction in agriculture—the Royal Agricultural College, Cirencester, which was the outcome of the efforts of a local agricultural society. This college dates effectively from 1845, when it was granted a Royal Charter. The college reached its heyday about 1860, when it possessed nearly 100 pupils, and enjoyed a considerable measure of prosperity up to 1890; but after that date it had to meet the gradually increasing competition of rate-aided institutions and, despite the subsequent aid given by the State, it was forced to close in 1915. Although England can claim the first college, Ireland established the first school. The Templemoyle School in Co. Derry was actually started in 1827, and was kept going until 1850, when its management was handed over to the Board of National Education. As early as 1838, this Board had begun to include agriculture in the curriculum of the National schools, and in the same year acquired for teaching purposes a farm at Glasnevin, near Dublin, a venture which eventually led to the establishment of the Albert Agricultural College. The main purpose was to qualify teachers to give instruction in agriculture, but the college was also open to intending farmers and land agents.

Thereafter a remarkable development ensued, for which no parallel can be found elsewhere: this was founded on the idea of engrafting the teaching of agriculture upon the ordinary activities of the primary school. In spite of opposition in Parliament, the idea met with enthusiastic popular support and gave birth to a development which is now regarded as of first rank importance as a corollary to all forms of agricultural education, namely, the appointment of "practical instructors" (the forerunners of the present day Agricultural Organizers) to go amongst farmers advising them on agricultural matters. As a result of this movement, twenty farms were taken from time to time by the National Board, and schools were started in connection with them. At each of these schools, resident pupils were taken, and special arrangements for their technical education were made. In 1856, all these schools were in working order. In 1874, however, as the result of the report of a Departmental Committee presided over by Mr. Gladstone, the number of institutions was reduced to two: one (a dairy school) at Cork, and the other the Albert Institution at Glasnevin.

After this collapse, it was not until the Department of Agriculture and Technical Instruction was founded in 1900 that progress was again resumed.

Modern Developments. The modern history of agricultural education in Great Britain really begins with the report of the Paget Committee in 1887. This was a Departmental Committee appointed to advise the Agricultural Department of the Privy Council on the question of grants to agricultural colleges and schools. As a result of the Committee's report, £5,000 was placed at the disposal of the Council for the aid of technical education in agriculture, and shortly afterwards the care of agricultural education was transferred to the Board of Agriculture when first established in 1889. After that date the Board assumed the entire responsibility, though for a few years (c. 1910) the Board

of Education assumed the care of rural developments of the subject. The Local Taxation (Customs and Excise) Act, 1890, provided "Whiskey Money" (*q.v.*), which was used in many counties to promote agricultural education, and might have led to greater developments had not the Education Act (1902), by imposing on local authorities the liability for the provision of other forms of higher education, diverted the larger portion of the fund to other purposes.

When the Board of Agriculture started operations in 1889, only four institutions solely devoted to agricultural education were in existence in England, all of them being private ventures.

At this time, all the leading foreign countries were far ahead of Great Britain in the national and systematic provision of education in agriculture, a position which subsequent developments in this country have done little to alter.

The first distribution of grants in 1889 extended to some twenty-five centres of activity in all, including Scotland, which up to 1896 was under the Board of Agriculture, thereafter being handed over to the Scottish Education Department. Most of these were dairying schools, but grants were made to the Aspatria Agricultural College in Westmorland; to the Swanley College of Agriculture in Kent; and to the West of Scotland Technical College, Glasgow. To the University College, Bangor, attaches the distinction of being the first institution of university rank to organize agricultural education. In 1890, a scheme was put into operation, which was founded on a close association between a group of surrounding counties and the college, a feature which was soon imitated elsewhere, and which was ultimately to find its most marked development in Scotland, where there are three provinces with Aberdeen, Edinburgh, and Glasgow respectively as centres. A feature of this form of organization is the provision of field experiments in the associated counties, combined with graduated courses of instruction in the central college. Between 1890 and 1895, similar schemes were started in Yorkshire with a central college at Leeds, in Northumberland, Durham, Cumberland, and Westmorland, associated with the Armstrong College, Newcastle; for a group of Midland counties centred round University College, Nottingham, subsequently removed to Kingston in Derbyshire; and at Aberystwyth, in association with a group of Welsh counties in the South and West. Soon after, an Agricultural Department was organized at Cambridge; and agricultural colleges were established at Edinburgh, Glasgow, and Aberdeen. In 1896, the South-Eastern Agricultural College at Wye, Kent, was founded, primarily to serve the interests of Kent and Surrey, both counties contributing liberally to its upkeep. In the same year, Cheshire established a college at Holmes Chapel; and, in 1909, the Harper Adams Agricultural College, near Newport, Salop, came into being. The result of this revival was, therefore, that, with the exception of a group of counties in the extreme south-west, every county had within easy access a centre of higher education, providing courses of various durations in agriculture, technical advice for farmers, and, often, superintending schemes of field experiments.

But, contemporaneously, many counties set on foot schemes of instruction on a lower grade, provided mainly through the agency of peripatetic instructors, whose duty it is to furnish advice both

incidentally and in the form of set instruction in such subjects as general farming, dairying, horticulture, poultry-keeping, farriery, and manual processes, such as hedging and sheep-shearing. Four counties started farm schools, more or less on the Continental model, in which short elementary courses (about twenty weeks) were given in farming and dairying. Between 1900 and 1910, little progress can be recorded; the increasing demands on Higher Education funds made local authorities chary of embarking on additional expenditure. Additional funds were provided in 1910 by the Development Commissioners, and what is now termed the Farm Institute Scheme was launched, the object of which is to stimulate the establishment of farm schools and the expansion of the staffs of peripatetic instructors. Several counties were induced to add to their agricultural staff, and adopted schemes for the erection of farm schools with farms attached.

Summary of Existing Organization. At the head we have the older Universities of Cambridge and Oxford. The former has a School of Agriculture, the latter a School of Rural Economy, which provide a Degree Course in Agriculture. At the former, there is, in addition, a Diploma Course providing more specialized instruction in agricultural science. Then, the provincial Universities of Durham and Leeds have special agricultural departments, providing courses of instruction leading up to a degree, as well as shorter courses of a lower grade. These curricula are paralleled by the University Colleges of Bangor, Aberystwyth, and Reading, all of which prepare students for a degree, and are linked to groups of counties. Then we have the more independent agricultural colleges: the South-Eastern College at Wye, serving Kent, Surrey, and Sussex; the Harper Adams College, Newport, serving Salop and Staffs; the Seale Hayne College at Newton Abbot in Devon; and the Midland College in Derbyshire serving a group of Midland counties. Of these, the first prepares students for the degree of the University of London; the last specializes in short courses in dairying subjects, and is organized more on the lines of a farm institute than a college. Further, we have the East Anglian Institute at Chelmsford, and Farm Schools at Newton Rigg, in Cumberland; at Sparsholt, in Hampshire; at Madryn, in Carnarvon; and others are in progress of foundation. In Lancashire, where central State control has been rejected, efficient technical instruction is given at the County Council's farm at Hutton, and more advanced scientific teaching at the Harris Institute in Preston. Finally, it should be mentioned that several counties give instruction through organized courses which are of the school order, though there are no specific sites set aside for the purpose.

In Scotland, progress has been made on similar lines. The country has been parcelled out into three provinces, with the Universities of Edinburgh, Glasgow, and Aberdeen as centres. At each an active school of higher education has been established, providing courses leading up to the B.Sc. degree, as well as short winter courses for farmers' sons. The links with the counties of the province are very close, and extensive activities in the shape of advisory and field experimental work are closely associated with the central college. At Kilmarnock, in the Glasgow province, where a successful dairy school has long been established, we have an institution that is on the lines of the farm schools which the English

Department have endeavoured to extend, and more recently the Aberdeen College has established a similar institution.

In Ireland, developments have proceeded on somewhat different lines. When the Irish Department was established in 1900, its founders were inspired by Danish experience, and deliberately adopted a policy of encouraging the spread of systems of itinerant instruction and the postponement of the establishment of new institutions in the nature of colleges and schools. Higher education was concentrated at Dublin round the nucleus provided by the long-established Glasnevin College. An agricultural faculty (including a Chair of Agriculture) was organized at the Royal College of Science, and the energies of both institutions have been mainly directed to the training of instructors for peripatetic work in the counties. Great attention continues to be paid to giving students a thorough knowledge of practical agriculture. More recently, a beginning has been made in the provision of systematic knowledge for the farmer class by the establishment of apprenticeship schools, where resident pupils receive a thorough practical and an elementary theoretical training. These may be considered as tentative farm schools with a strong practical bias. In Ireland, the provisions for the teaching of women are more advanced than elsewhere in the United Kingdom, more especially in dairying and domestic science. In the former subject, an excellent residential school is the Munster Institute, Co. Cork, where dairying in all its branches, as well as domestic subjects, are taught. The peripatetic local winter schools of agriculture, known there as "Organized Courses," are a prominent feature of county activities; and classes for technical instruction in butter-making, horticulture, poultry-keeping, etc., have had great success. A remarkable feature of the Irish system is the great attention which is given to the supply and training of suitable teachers, and the close supervision over their work which is exercised by the Central Department. This is rendered possible by special features in the Irish system of local government which make the authorities dependent for a large proportion of the necessary funds on Imperial sources, and, consequently, entail a measure of control and co-ordination which the English system does not permit.

Curricula and Scope. When the systematic teaching of agriculture was first instituted, there was (and still continues to be in some degree) a great dearth of teachers, more especially on the scientific side. The only special science was agricultural chemistry, which had two well-developed branches: first, the chemistry of soils and manures, greatly dependent on the work of Lawes and Gilbert at Rothamsted; and, second, the chemistry of animal nutrition, inspired on the theoretical side by the work of the early medical physiologists and in the more practical aspects of cattle feeding by that of German workers in this field. In botany, there was little agricultural specialization, but the study of grasses and, in a less degree, of plant diseases had some technical outcome. Again, some of the known facts of geology and entomology had an agricultural bearing. In practice, for many years the nucleus staff of a college consisted of a lecturer in agriculture and a lecturer in agricultural chemistry, the former including the elements of the other sciences mentioned in his teaching. In the modern college, the staff contains more specialists. Agricultural botany is now generally taught as a special

subject, and includes mycology; entomology and animal physiology are often treated separately. The more technical subjects of surveying, book-keeping, poultry-keeping are often taught systematically, and at some of the smaller institutions technical instruction in cheese-making is added. Lastly, the elements of the veterinary art are generally taught by a specialist. When the outlook of the institution is more elementary, the teaching becomes concentrated on the actual operations of the farm; and the applied results of science are only introduced as necessary, with less consideration of the "theory" and experimental data from which they have been derived. All the agricultural colleges have farms attached to them: in some, practical manual work is expected of the students; at others, open-air demonstration classes are regularly conducted; while, at some, only occasional visits for special purposes are paid to the farm. It cannot be said that practice in regard to the use of the farm for instructional purposes, or, indeed, in regard to the syllabus generally, has yet crystallized; but it is generally agreed that the curriculum should aim at a complete training in principles, which must be supplemented by actual practice during residence on a farm.

Finally, one of the most important and useful functions of the Agricultural College is to provide advice for farmers on technical and scientific questions, and to conduct original research in the agricultural sciences. The provision of adequate funds for the promotion of scientific research in agriculture dates from 1910 only; but, when the War broke out, considerable additions to knowledge had already been made at the institutes founded or extended by the aid of Development grants. The territory still to be invaded, however, is immense; but the awakened interest of the nation in the application of scientific research to the advancement of industry, justifies confident hopes for the future; while the recognition of the national importance and the essential dignity of agriculture may promote in our husbandmen a still higher standard of endeavour and a more enlightened interest in the science of their art than they have shown in the immediate past. (For Education in Agriculture Abroad, see the articles on Education in the respective countries, especially DENMARK, UNITED STATES, FRANCE, and GERMANY.) A. B. B.

AGRICULTURE IN SCHOOLS AND COLLEGES, THE TEACHING OF.—The problem of agricultural education is no new one in this country. As far back as 1651, Hartlib published his *Essay for the Advancement of Husbandry-learning: or, Propositions for the Erecting of a College of Husbandry, and, in order thereunto, for the Taking in of Pupils or Apprentices*; and, in 1696, Bellairs wrote a book called *Proposals for Raising a College of Industry of all Useful Trades and Husbandry*. A century later (1799), Marshall, an important agricultural author, described his *Proposal for a Rural Institute or College of Agriculture*, and the Earl of Egmont is said by Young to have had on his estate a college where farming was systematically taught. The first of the existing enterprises in this country was the permanent establishment, in 1790, by Sir William Pulteney of the Chair of Agriculture and Rural Economy at Edinburgh; six years later, the Sibthorpe Professorship of Rural Economy at Oxford was founded. These, however, important as they are, were only isolated chairs at great

universities: the Cirencester College, devoted wholly to agriculture, was established in 1842, and played a great part in the development of the agriculture of the Empire till 1916, when it was closed.

Thus there has long been college training for those who could afford it. For those who could not, the facilities were not so good. In 1875, the old Science and Art Department instituted examinations in agriculture, granting certificates with a view to inducing schoolmasters and others to start evening classes and spread knowledge to a wider circle. These efforts, though good, were insufficient; and farmers urged seriously that school-education did nothing to help the boy who wished to take up practical farming—nay, that education positively unfitted a boy for farming. A great change came in 1890, when the Local Taxation (Customs and Excise) Act put the so-called "whiskey money" at the disposal of the county authorities for technical education, and made provision for the first time for agricultural colleges, farm institutes, and other agencies for agricultural instruction. Various institutions began to spring up, and at the present time a number are receiving Government grants.

In deciding on the proper means of teaching agriculture, it is first of all essential to envisage clearly the object in view. Agriculture means strictly the cultivation of the land, but it also includes the growth of crops and the care of animals. The successful pursuit of agriculture involves the successful control of the growing plant and of the living animal. Agriculture, in short, is essentially a science. But it is something more: being carried out mainly for profit, it is a business as well. In reality, the science and the business are wholly distinct, and it is a misfortune that the same man is usually expected to manage both. There is now some tendency to segregation, and numerous posts on the scientific side are arising in connection with the colleges and county councils for which business aptitude is not essential.

The recognition of these facts indicates the lines on which agricultural education must proceed. As the agriculturist has to deal with living things, he must be observant and adaptable, and possess a knowledge of the ways of living things. No knowledge of rules, however complete, is sufficient, because no two living things are quite alike: every animal or crop is certain to present some abnormal features. Secondly, the agriculturist must have knowledge of the methods used elsewhere and of the results obtained, in order that he may be able to pick out anything that seems specially suitable to his own conditions. And, lastly, seeing that agriculture is not so lucrative as other businesses, the farmer must be shown some of the wonderful interest of the countryside, so that he may find in the greater fullness of life some compensation for the lack of opportunities to amass wealth.

Agriculture in Elementary Schools. It is generally recognized that this education should begin in the elementary school, but at first aim only at the first and third of these objects. The child can be taught something of the ways of plants and animals; of the properties of soils, air, and water; and of the general phenomena of the countryside: this is already widely done under the name of "Nature Study." The essence of this Nature Study is that the thing itself should be before the class: the children should see and handle it, and observe for

themselves its significant properties. It is this that constitutes the great practical difficulty: not only has the material to be provided, but the teacher has to stand the cross-examination of his class, and run the certain danger of being asked questions which he cannot answer and on which his text-books are exasperatingly silent. Thus Nature Study differs from most other school work: the multiplication table, for example, is completely known, and the teacher could answer with promptitude and certainty any questions his scholars asked; the properties of a leaf, however, are not completely known, and even the wisest may easily find himself beaten by the simple question of a child. Much useful information can be obtained from *The Book of Nature Study*, edited by J. B. Farmer; and from the "Nature Study Series" of the Cambridge University Press. But no book completely suits the purpose, and it is highly desirable that the teacher should be linked up with the man of science working in the laboratory, to whom awkward questions can be referred. The teacher and the man of science are alike ready and willing, but the link is not yet provided: summer courses at university colleges seem to be the best method.

It is not the purpose of the writer to discuss Nature Study at length: the main point is that a well-conducted Nature Study class provides the best means of teaching children the general ways of plants and animals, and arousing their interest in the common objects of the countryside. In the elementary school, this is as much as can be done.

Outside the classroom, however, it is possible to go further. The school garden affords opportunities for teaching the elementary principles of soil management and crop production, besides inculcating the love of one of the most useful of the countryman's arts.

The Rural Secondary School. After the elementary school stage, the children fall into two groups: some will go straight to work, while others will go on to secondary schools.

Unfortunately, we are not well provided with rural secondary schools, although some of the grammar schools (e.g., Shepton Mallet, Brewood, Dauntsey, and Barnard Castle) have rural sides. They exist in America, and a considerable number of text-books have been written for them.

The work at rural secondary schools should be mainly educational, but with a distinctly vocational bias. The pupil should be taught the elementary properties of soils, and the simple facts of the growth of plants and animals. Experience has shown that a definite self-contained subject can be made, treated in a scientific manner and of definite educational value. The teacher in Great Britain will find the "Farm Institute Series" of the Cambridge University Press useful.

At this stage, the aim is still to educate the pupil: to develop his intelligence and thinking powers; but this is done through the common processes of agriculture. Incidentally, the pupil learns a great deal of purely technical matter: of things done to secure a better return or a higher profit; in the main, however, he learns "why" rather than "how." These secondary schools should not only teach something about the living things of the farm, but also about machinery, which is playing an increasing part in agriculture. The internal combustion engine has revolutionized life in all sorts of ways, and is coming on the farm: no one can tell where it will stop. Already it has given us the

tractor and the motor plough, and the farmer of the future who knows nothing about machinery will be severely handicapped in the struggle for existence.

Further, these schools should teach the elements of book-keeping, this being very necessary to successful farming.

This programme is probably extended enough, and it is undesirable to overload it by introducing too many subjects. It is probably unnecessary, for example, to teach chemistry or botany on the ordinary conventional lines: the simple laws of Nature, of course, must be taught, but that can be done as well by studying air, water, the soil, and the growing plant, as by any other means: T. S. Dymond's book *Chemistry for Farm Students* furnishes an example. But the syllabus ought to include some literary subject. The farmer has long winter evenings at home: it is not easy to go out even if he wishes, and he must have some change from farm work. If at school he could be given a taste for English literature he would have an abiding possession of great value. But the course needs careful thinking out: it is no use strangling the pupil's incipient taste by giving him something which is far beyond him and which he is never likely to read again once his school days are over.

The Rural Evening School. Evening schools should work on substantially the same lines. It must be recognized, however, that there are peculiar difficulties, which are intensified by the rule requiring a certain minimum attendance at the class. Country boys have to walk considerable distances to school and, after a hard day's work in the open air, are more likely to go to sleep than to attend to a serious lesson. No general advice can be given: the course must obviously be on definite lines, and be made as interesting and topical as possible. Until the Education Act (1918) there was no means of enforcing attendance at evening schools, and the teacher had to make his course serve the double purpose of attracting pupils and instructing them.

The evening class work requires supplementing by more strictly technical and manual work, which is possible only by daylight on an actual farm and requires skilled itinerant instructors. Hedging, thatching, milking, care of poultry, etc., are all suitable subjects. Work of this sort is usually popular, especially where there is the stimulus of competitions for prizes. It can be considerably extended by having market-day lectures on manuring, feeding, etc. It is necessary, however, to avoid the error of making this the sole work in agricultural education: counties where this is the case are notoriously backward, whilst those that take a more liberal view and make a wider provision have the reward of seeing a great demand arise. Instances are afforded by Kent, Surrey, Yorkshire, etc., where, in addition to the ordinary instruction, flourishing colleges have arisen, well filled with students.

Agricultural Colleges and Farm Institutes. Some of the pupils will pass from the secondary or evening school to college. These, again, fall into two groups:

1. Those who propose to take up practical farming and run it as a business.

2. Those who wish to follow agriculture, not as a business, but as a science, and who therefore wish to qualify for advisory or teaching work.

Those taking up farming as a business must go through a carefully worked out technical training at the college, stress being laid on farm classes,

woodwork, ironwork, soil management, etc. The method of teaching is the same, whether the course lasts for six weeks or two years, and whether the institution is a college or a farm institute. Colleges situated in the country (*e.g.*, the Harper Adams College at Newport, Salop; the Midland at Kingston, Derby; and Wye, in Kent) have for this work an obvious advantage over those situated in towns.

Students who are going in for advisory and administrative posts require different treatment. The main purpose is to turn out highly educated, intelligent men and women capable of grasping new ideas, and of critically examining matters presented to them. Actual technical knowledge is less important than highly developed intelligence. The teacher's problem is, therefore, similar to that of the secondary school and of the ordinary scientific departments of the university colleges.

The London University gives a B.Sc. degree in Agriculture which is open to private students or students of any institution in the Empire: the syllabus gives a useful indication of the lines on which work may proceed, whether the candidate proposes to try for a degree or not.

The Agricultural Expert. Finally, the training of the expert demands attention. This is on the same principles as the others, but a higher degree of intelligence and critical ability is required. On the whole, the best training is afforded by pure science, where the methods of presenting the subject have been more fully developed, and the demands on the student's intellectual powers are consequently greater. The best results are usually afforded by a training in an Honours School of Science at one of the universities: the student should be good enough to obtain a First Class. He can then proceed to study the technical side at one of the agricultural colleges, but it is not always necessary for him to enter as a student: an opportunity may arise for taking a subordinate post on the staff. Most of the agricultural experts of to-day obtained their training in this manner.

E. J. R.

AGRIPPA, HENRY CORNELIUS.—Born at Cologne in 1486, he was of a noble family which had been greatly distinguished in the Italian wars of Maximilian I. After graduating as Doctor of Laws and Doctor of Medicine, he travelled in France, Spain, and England; and, later, taught theology in Pavia and Turin. He married and settled at Metz, and was appointed physician to the Queen-mother of Francis I; but his opposition to the popular superstitions of the age led to his expulsion from the Court.

In 1529 he was appointed Historiographer to Charles V, and began his work with a history of Charles's government. In 1530, he published a treatise on the *Vanity of the Sciences*, a satire on contemporary professors, in which he exposed popular errors; and *Occult Philosophy*. These works were much in advance of the age, and Agrippa's superior knowledge led his persecutors to accuse him of being guilty of irreligious practices. A prosecution in 1531 brought imprisonment at Brussels and, after his release, a further imprisonment for a libel on the Queen-mother. On his final release, he went to Grenoble, where he died in the same year (1535).

Agrippa was an admirer of Luther and in general sympathy with his attempts to reform the clergy; but he objected to the tyranny exercised by the mendicant friars over the consciences of

men, and remained in the Roman Catholic communion.

AIDS, VISUAL.—Few subjects are now taught in schools without visual aids to assist the eye, the chief organ by which everyone must learn. Pictures, at first rigidly excluded from reading books, are now one of the chief criteria of the value of such books. Pictures and diagrams adorn classroom walls as aids to learning, understanding, and remembering. All elementary teaching of arithmetic is aided by concrete illustrations, such as beads, sticks, coloured chalks, squared paper, cards, coins, actual weights and measures. Most schools have their collection of natural and manufactured objects useful in the study of Nature and of mechanical processes. The magic-lantern and the cinematograph are most useful visual aids for teaching geography, natural history, and literature.

AILMENTS AND INFECTIOUS DISEASES IN SCHOOL LIFE.—From the school point of view, these can be divided into: (1) The completely disabling, which render it impossible or inadvisable for the child to attend school; (2) the incompletely disabling, which do not entirely prevent school attendance, but impair the school efficiency.

All illnesses associated with an elevation of temperature are completely disabling. Every school teacher should have in his possession a clinical thermometer, and should be familiar with its use. It can be taken as an absolute rule that no child with a raised body temperature can safely remain in school. He ought to be sent home or go to bed. If this rule were universally acted on, many cases of ordinary influenza colds or chills would be promptly dealt with which would otherwise develop into pneumonia. Many epidemics of infectious illness, particularly measles, would be limited if teachers observed these matters closely. If simple "stomach ache" were dealt with as being possibly of a more serious nature, many attacks of appendicitis would be robbed of their virulence, and many lives be saved. Ordinary influenza colds should always be recognized as suspicious. Children should always be kept away from school during the acute stage. If this were done as a routine thing, it is highly probable that the amount of absence from school owing to sickness would be largely diminished instead of increased.

The Infectious Diseases that need recognition in school life are—

1. **FEVERISH COLDS** and **INFECTIOUS SORE THROATS.**

2. **MEASLES**, which begins about fourteen days after exposure to infection with a feeling of chilliness, tiredness, slight headache and sore throat, and a watery condition of the eyes, together with some sneezing. About the third or fourth day, measles manifests itself by a spotted red rash over the face, chest, and arms.

3. **SCARLATINA**, which begins generally about two to eight days after exposure to infection, with headache, sore throat, often vomiting, chilliness, backache or aching pain in the limbs, offensive breath, and raised temperature. Within about 24–48 hours, a fine red rash appears at the front of the arms, chest and back, forehead and face, and soon spreads over the body.

Occasionally the disease is so mild that it is not detected. A child may, therefore, continue in school till some complication, such as Bright's disease,

occurs. This is characterized by puffiness of the face, headache, and lassitude. Often, on close inspection, small scales of peeling skin may be noticed in the palm of the hand or between the fingers, in the crease of the elbows, or the inner part of the upper arms, or on the forehead or neck.

4. **DIPHTHERIA**, in its usual form, occurs as a severe illness with sudden onset, great pain in the throat, offensive breath, great pain and, may be, swelling in the angle of the jaws. The milder forms are dangerous from the fact that they are often overlooked, and not infrequently occur in a very obscure and insidious form. If the diphtheria bacilli invade the nose, the poison may be limited to the nasal passages. The throat itself may be clear. The patient then suffers from a stuffy nose, which persists a long time—may be several weeks. He seems to be only slightly ailing, and has no raised body temperature. When several cases of diphtheria occur in a series, it is necessary to have all the children very carefully examined, and specimens of the secretion taken from each child by means of swabs, to be sent to a public health laboratory for microscopic examination. It has been recorded that a single mild unobserved case of such nasal diphtheria was the cause of three deaths in a class in a public elementary school before the actual source was accidentally discovered.

MUMPS is characterized by a swelling at one side of the face at the angle of the jaw, generally, but not invariably, painful. It occurs about three weeks after infection. Within seven to eight days, it frequently spreads to the other side of the face.

CHICKEN-POX is frequently, but not invariably, a mild disease. It may, however, be followed by a prolonged period of debility. It is associated with slight stomach disturbance, debility, and tiredness. After a few days, a few red raised spots, which soon contain clear fluid, appear on the chest and trunk. These give place to a scab with some red, inflamed skin around. The spots generally first appear on the body, and may be only few in number. Within two or three days, new crops appear, and the process is repeated while the illness persists, that is to say, for about three weeks.

Incompletely Disabling School Ailments. Owing to the much greater excitability of the reflex nervous system in children, any bodily disorder has a great effect in disabling the current of thought, and rendering mental concentration impossible. Even mild forms of toothache, headache, or rheumatism quite disable a child from concentrating his attention on school work, and cause him to dissipate his energies in such a way as to lead him into difficulties with those whose duty it is to secure some uniformity in school discipline.

IMPERFECT SENSE ORGANS. Minor imperfections of sight and of hearing are often unrecognized, both by the teacher and by the pupil. They may lead a child to make such repeated and often vain efforts to keep up with normal children as will lead to a serious strain of the nervous system. The more marked imperfections of sight and hearing can hardly be passed over. In the case of grave defects of hearing, the pupil ceases to make any effort to listen; but in the minor forms, he is often unconscious of his efforts. The failure to hear particularly affects soft consonant sounds *n*, *m*, *g*, and less frequently affects vowels.

AFFECTIONS OF THE BRAIN AND NERVOUS SYSTEM. Since all school education depends on the capacity

of the structure of the brain and nervous system to receive and combine sense impressions, it is evident that not only the sense organs but also the nerve elements in the brain must be capable of receiving accurately impressions of sight and hearing; the means by which these impressions are combined and brought within the field of consciousness and memory, must also be well equipped. The capacity of these nerve knots for functioning properly depends on several factors: Firstly, their natural and innate capacity for stimulation and growth. This, being largely a matter of innate endowment, varies greatly among different individuals, and causes the difference between different boys. Members of a family often exhibit great similarity to each other in this respect, according to the laws of heredity. Secondly, according to the child's freedom from those accessory complications of disease which cause nerve deterioration. The illness which partially disables the activity of the brain and nervous tissue is the poison associated with rheumatism and St. Vitus's dance. With these diseases, sore throat and anaemia are frequently combined, or may be the most prominent manifestations. In a considerable proportion of cases, the heart valves are also impaired, which both exaggerates the emotionalism and diminishes the power by interfering with nutrition.

Very mild but definitely impairing forms of St. Vitus's dance and rheumatism (for they are probably one complaint, not two) are extremely common in school life, and account for a great deal of what passes for stupidity, disobedience, and inattention. It cannot be too strongly insisted on that self-control and attention require a vigorous activity of the nervous system, and these are often gravely undermined in many young adolescent children, owing to the poison of rheumatism or chorea, or of anaemia; and that the treatment of such apparently moral failures of conduct is neither corporal punishment nor school detention, but physical rest and medical treatment. In all cases of inattention, silliness, and lack of control, full inquiries should be made as to the hours of sleep and the possible presence of mild St. Vitus's dance. In some cases, the only signs of the complaints recognizable by the teacher are frequent sore throats; but the physician, and even the drill-sergeant, may notice lack of power to maintain body or shoulder balance.

CONDITION OF THE CIRCULATION. The variation in the power of the heart to sustain vigorous activity has been already alluded to; but consideration needs also to be taken of such local stagnations or sluggishness of the circulation as gives rise to cold hands and feet, chilblains, etc., and which indicate a lack of local nutrition. Their treatment is generally medical; but home care may provide adequate feeding, warmth, and freedom from restrictive clothing.

CONDITION OF THE BREATHING. The free entry of oxygen into the blood by way of the lungs is an essential condition of school activity. Hence, such local obstructions to entrance of air—as adenoids, enlarged tonsils, nasal catarrh—are matters which should receive adequate attention. (See NOSE, HYGIENE OF THE.)

TYPHOID OR ENTERIC FEVER. This is the most difficult of all notifiable infectious diseases to detect. It is at times exceedingly mild, and at other times intensely severe. A mild case begins with slight feverishness (temperature often only rising to 99°

or 100° for a few nights), general tiredness and weariness, slight headaches, and inability to do mental or physical work. Some irregularity and disturbance of the bowels either in the form of flatulent distress and constipation, or diarrhoea. In about 50 per cent. of the cases, a few rose-coloured spots appear on the stomach. In marked cases, the patient is so evidently seriously ill, that there is no danger of the disease being overlooked.

NON-FEBRILE INFECTIOUS CASES DUE TO PARASITES. Besides the acute zymotic diseases above mentioned, it is necessary for those who have charge of schools, when any mixing of clothes is possible—as in the use of a swimming-bath or the use of towels and caps—to take particular notice of possible parasitic skin disease, which may appear on any cleanly children quite unexpectedly. There are two common forms—

RINGWORM. Here the parasites consist of a microscopic fungus, which may affect any part of the general surface of the skin, or may find a nidus among the hairs of the head. In the former case, it is readily detected. In the latter, it may remain hidden for some days or weeks, till the falling off of a number of broken hairs leaves a bald space, and so attention becomes drawn to its presence. It is then sometimes very obstinate. Medical advice should always be sought.

ITCH. A mild form of this disease is not rare among cleanly people. It often dates from a visit to the seaside, where it has been caught from bathing costumes. A few not very inflamed spots are noticed on the body surrounded by marks of scratching. On full inquiry it is found that the itching is very severe, and especially occurs at night time. The disease is often passed over as a form of eczema or as heat spots, though it has no resemblance to either of these when carefully examined.

A. A. M.

AIMS AND IDEALS OF EDUCATION.—Three problems are involved in a discussion of this topic. I. The first concerns the nature of aims and ideals generally speaking. What is their nature in relation to actual conditions, to positive fact, to customary experience? It is quite clear that an aim, and still more, an ideal, involves dissatisfaction with existing conditions, and an effort to depart from them. But out of what material shall the aim and ideal be then constituted? Whence shall it be derived? What shall guarantee ideals against being mere products of fancy? An aim, in short, while it contrasts with the existing state of affairs, must have sufficient contact with it to be practicable, to be capable of application to re-direction of existing conditions. An ideal, unless its value is to be purely emotional and inspirational, can differ from an aim only in possessing greater generality, greater scope and depth.

The problem has a definite bearing upon the discussion of educational aims. In general, they are divided into two classes: Those which find the ground of dissatisfaction simply in the ignorance, immaturity, lack of skill, and control of the young; and those which draw the material of their ideals from dissatisfaction with existing social conditions. The first has the easier task. It derives its aims from the best achievements of existing adult life. Its essential aims are to reproduce these standards in the young; to bring the latter up to the level of what is best in the traditions and customs of the people to which those undergoing education belong.

Education is conceived of as essentially a process of transmission and indoctrination.

The other school derives its aims and ideals from a consideration of the defects of existing society. Its dominating ideal is social reform, re-organization even on a large scale. It regards the period of immaturity not as something to be passed through on the way to reaching the adult level, but as an opportunity of progress to be taken advantage of in the process of creating a new and better society. Plato's educational scheme is a typical instance of this educational philosophy. The special aims of education are connected with an ideal of social reconstitution. Apart from his larger plan of social modification, they have no meaning or validity. The educational writings of Aristotle, on the other hand, assume as the aim of education the general maintenance of some existing polity, or, in particular, the production of a character embodying the best traits of the cultivated Athenian citizen. In modern times, the radical social thinkers, like Godwin in England and Helvetius in France, conceived education as the potential means of establishing a new social order. The latter, in particular, exaggerated Locke's idea of the mind as originally blank, and regarded the differences among men as the product of practice and of the influence of the environment, and so asserted the omnipotence of education. It can create, if properly directed, a new type of character which will manifest itself in a new social and moral *régime*. Curiously enough, Rousseau, who started from the opposite premise of innate qualities and a natural inner development which education must respect, comes to the same practical conclusion. Existing society, with all its evils and oppressions, is the result of thwarting natural powers and distorting the intrinsic course of development. An education in accord with Nature will, therefore, be the surest way of avoiding the corruptions and enslavements of existing civilization and of creating a new and purer social type.

This brings to light another distinction between the ideal of transmission and reproduction and the ideal of a reconstituted society. The former relies logically upon the use of organized subject-matter, representing, as in Matthew Arnold's definition of culture, the "best of what has been thought and said." It regards education as essentially a process of *instruction* by which the mind is moulded into conformity with the models presented in the subjects studied. Plato, on the other hand, insisted upon the need of creation of *new* studies, such as mathematics and dialectics, insisting also upon the need of careful purging and rigid censorship of existing materials. Rousseau and his modern followers subordinate inculcation of any and all subject-matter to the natural unfolding of native powers. The ideal of education is not a shaping or forming from without, but a developing from within.

Another sharp clash in educational ideals is properly connected with the distinction under discussion. Some theories have emphasized the social aim of education, others the individualities. This opposition is not, however, ultimate in character. Upon examination, it will be found that the ideal of "a complete and harmonious development of all the powers—spiritual, mental, and physical—of the individual" (the favourite formula for the individualistic aim) implied, as its counterpart, a new and better society. A direct social aim was not



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University College of Wales, Aberystwyth

contemplated because the educationists of this school—such as Pestalozzi and Froebel—were acutely conscious of the evils of existing society. To have trained for membership in such societies would, in their minds, involve distortion and corruption of individuals, and a perpetuation of existing defects and wrongs. This motive appears vividly in the educational writings of Kant, who sets up a remote social ideal, the evolution of an ideal humanity, but who is opposed to public education—education for citizenship, because that signifies that education will be conducted by the ruling class not so as to develop humanity, but so as to produce warped personalities as tools for the execution of the rulers' purposes. The same ideal was clearly expressed also in the closing years of the eighteenth century by Humboldt in his essay on the *Limits of State Action*, which exercised such an influence upon Stuart Mill: "An unhampered development of all the powers of the individual is the surest road to a redeemed social order."

If educationists are confined to a bare choice between the ideal of social transmission on one hand, and complete social transformation on the other, they are in a sad plight, and their choice will have to be made arbitrarily—not on educational grounds, but on grounds of general social and political preference. But the value of the opposition as it is presented by extreme thinkers is that it puts before us *factors* that must be reckoned with in forming all educational aims and ideals. The forces making in practice for the more conventional and conservative ideal are strong. They almost enforce themselves without any assistance from the side of philosophic principles. The most vehement educational reformer, if he attempts the definite work of concrete instruction and discipline, finds himself thrown back upon existing materials and habits. It is not possible to escape from them. He must employ transmitted material as the *means* of education. But that does not signify that the *ideal* shall be found in the means. The problem is to use existing knowledge, habits, institutions, as means of producing characters that, in being sensitive to what is best in existing civilization, shall also be critical of its defects, and equipped for its improvement. The radical or revolutionary school that has found its ideal in contrast with existing conditions has made a valuable contribution which must be included in every sound philosophy of education. Childhood and youth are not merely periods of immaturity. They are not chiefly negative. The period of special need of education is not one of defect or gap, of absence of adult achievements and standards. Plasticity does not signify a mere passivity to be shaped from without. Childhood and youth present something positive and active, the power of *growth*. They present, therefore, the maximum *possibilities* of social improvement and rectification with the minimum waste and friction. Social reform that deals with adults whose habits of thought and feeling are more or less definitely set, and whose environment is more or less rigid, is working at a disadvantage.

II. The Relation of Aims and Ideas to Existent Facts.—We find here the solution of the problem of the relation of aims and ideals to existent facts. Growth is itself the primary *fact* with which education deals. To protect, sustain, and direct growth is the chief *ideal* of education. It remains to make this general statement more definite by applying it to

consideration of some of the chief aims about which educational discussion turns. The purpose will be to show that Growth as an aim includes what is valuable in all of them. Our second chief problem concerns, then, aims and ideals which have obtained a certain vogue, such as preparation for life, discipline, natural development, culture, social efficiency, etc. How are they related to promotion of growth as an aim?

The ideal of preparation becomes self-contradictory when it is not secondary to the maintenance of the process of development. This is true, whether we take the half-formulated aims of preparation for promotion, for passing examinations, for entrance into some higher school, or the generalized conception of Spencer that education is adequate preparation for life. The end, if conceived merely as something delayed and postponed, something affecting exclusively a future time, has no intrinsic connection with the students' present activity. It fails to supply adequate motive power. A vaguely discerned future disconnected from the present has little impelling power. It is so adventitious, that external stimuli have to be resorted to, such as threats of immediate penalties, promises of immediate rewards. A merely remote end also encourages procrastination. The present offers many attractions. These tend to crowd out an aim which can be realized only in some indefinite future. Making preparation the chief end fails, in other words, to secure good preparation. Continuous growth, on the other hand, effects a continuous re-organization of powers. Although it has an application in the present (since the pupil is to be growing here and now), it also leads continuously into new fields. The process of realizing present possibilities means a constant advance. It results in preparation, although preparation is not made the mainspring of effort.

The so-called individualistic aim, self-realization, or the full development of all powers, can be made definite and effective only when translated into terms of growth. As has often been stated, the ideal of complete development is only a species of the preparation ideal. Development is conceived as a product—not as a process. It is thought of emotionally rather than intelligently. It stands for something noble and sublime, but something projected into the mists of the unknown. Development, on the other hand, as an active process means *developing*—something taking place, if it takes place at all, in the present. Hence it is capable of observation and record; it can be made definite. Whether a pupil is now growing and in what direction, are matters of fact and not of blind aspiration for something far-away. Moreover, a purely future and remote development of all powers fails at the precise point where it makes its chief claim. It is not truly individual, but is a general formula whose exact application to individual pupils remains uncertain. Since no two pupils are duplicates of one another, complete development cannot signify for one person what it means for another. The quality of growing, on the other hand, is an individualized affair. The question is whether the particular person is living up to his own possibilities. He is judged on the basis of his own powers and his own environment. The test is whether he is taking full advantage of them. Complete development does not mean something abstract and absolute, but something relative to individual capacities and opportunities.

If the principle is clear, it is not necessary to apply it in detail to conceptions of culture, training or discipline of faculties, etc. Culture must mean a present refining, broadening, and fostering of processes of growing, if it is to be an aim available for guidance, and not a vague aspiration which can be rendered definite only by arbitrary translation into personal taste and preference. The idea of discipline through repeated exercise of faculties upon definite tasks has been founded upon a conception of faculties which present psychology holds to be mythological. It has also been used as a defence for all measures which make learning so difficult as to be obnoxious, while all outworn traditional topics have protected themselves from examination by a claim to be disciplinary. Discipline can be substantiated as an aim only in so far as we fix our attention not upon vague so-called faculties, but upon actual instincts, impulses, habits, desires, and ask how these are to be so employed as to lead to increase of present *power*—of power to do, to accomplish. Only the incorporation of the idea of growth will render the idea of discipline positive and rational.

III. Growth as an Aim and Ideal. Does not, however, the conception of growth imply something final and remote toward which growth is directed? Must we not conceive of growth as approximation to a far-away goal? If so, growth cannot be an aim and ideal except in a secondary sense. This question raises some of the deepest issues of philosophy. Is the universe static or dynamic? Is rest superior to movement as a sign of true reality? Is change merely a falling away from or an approach to something fixed, changeless? Is evolution a positive thing, a reflex of power; or is it negative, due to defect and the effort to pass beyond it? An adequate discussion of such questions would take us far beyond the limits of this article. In addition to noting that the philosophy of education—here as elsewhere—finally leads into general philosophy, we must content ourselves with two remarks.

In the first place, the conception of growth as merely a means of reaching something which is superior to growth and beyond it, is a survival of theories of the universe as being essentially static. These theories have been expelled by the progress of science from our notions of Nature. Motion, change, process, are fundamental. In the last half century these same ideas have been successfully applied to the life and structure of living things, plants and animals. The moral sciences, to which education belongs, have become the last refuge of ideas which have lost their intellectual repute elsewhere. The scientific presumption is working against them everywhere.

In the second place, even if our ultimate philosophy accepts a static conception of reality to which growth is relative, yet the educator, if his aims are to be at once definite and capable of support upon the basis of ascertained fact, must start from the process of growth. He must obtain from it clues and hints as to the nature of the final end, instead of trying to decide what is and what is not growth on the basis of a conception of an ultimate end. Opinions as to the latter differ widely. To start from that end is to involve education in disputes that cannot be decided except by personal taste or the acceptance of external authority. The physical growth of a child can, however, be decided by tests applied to present conditions—observable and

recorded changes in height, weight, and other phenomena. These things, and not an ideal of an ultimate physical perfection, guide the wise physician and parent in estimating whether a child is growing, standing still, or retrograding. The problem of the educator is, likewise, to devise means of studying and discovering changes actually going on in the mental and moral disposition of pupils, and to construct criteria for determining what these changes signify with respect to growth. Only as the philosophy of education recognizes that for its purposes, at all events, growth is the chief aim and ideal, can philosophy be applied intelligently to the specific facts of education, instead of remaining a body of remote and inapplicable—even though lofty—conceptions.

J. D.

ALBERT AGRICULTURAL COLLEGE.—(See AGRICULTURAL EDUCATION.)

ALBERT OF YORK.—This great ecclesiastic, known in the *Anglo-Saxon Chronicle* as Ethelbert, flourished in the eighth century, when his fame as a teacher extended to France and Germany. He was the brother of a Northumbrian king and, after being brought up at York Minster, entered the Church at an early age. Subsequently becoming master of the Cloister School at York, he was renowned for his teaching of grammar, law, music, astronomy, and theology. His pupils included sons of nobles, and Alcuin, the friend and adviser of Charlemagne. He became Archbishop of York in 766, and superintended the rebuilding of York Minster with the assistance of Alcuin (*q.v.*) who had succeeded him as schoolmaster, and to whom he bequeathed his famous library, probably the first great collection of the kind in England. Albert died at York in 780.

ALBERTA, EDUCATION IN.—(See CANADA, EDUCATION IN.)

ALBERTA, LEON BAPTISTA (1404-1484)—A famous Florentine architect and man of letters, who erected the church of St. Francesco at Rimini and many other famous buildings in Italy. His views on architecture are contained in his *De Re Aedificatoria*, which has been translated into Italian, French and English. His architectural work and his writings on architecture gained for him the title of the Restorer of the Architecture of Italy.

AL-AZHAR, THE MOSQUE OF.—(See EGYPT, THE EDUCATIONAL SYSTEM OF.)

ALBERTUS, MAGNUS.—He was born in 1200, was a student of Padua University, and became famous for his attainments and untiring industry. Joining the Dominicans in 1222, he taught theology at Cologne, Paris, and other cities. Thomas Aquinas was one of his pupils in Paris. For a short time, he was Bishop of Ratisbon (1260); but as his episcopal duties interfered with his studies, he retired to the monastery of Cologne, where he remained till his death in 1280. His numerous works include commentaries on the Scriptures and on Aristotle. As a diligent student in physical science, Albertus became intimately acquainted with many of the fundamental principles of chemistry and mechanics.

ALBINISM.—(See EYESIGHT OF SCHOOL CHILDREN, THE.)

ALBUCASIS.—(See CORDOVA, THE UNIVERSITY OF.)

ALCALÁ, THE UNIVERSITY OF.—The University of Alcalá was founded in 1508 on the initiative of Friar Francisco Jiménez de Cisneros, and came into being with an organization and character different from those of the University of Salamanca (*q.v.*), of which its illustrious founder was an alumnus. In contrast with the democratic organization of the University of Salamanca that of Alcalá was constituted under the centralized dictatorship of the College of San Ildefonso. The end which its founder had in view in creating the new institution is clearly seen from its statutes. It was simply to provide a perfect ecclesiastical education as one more instrument to further the method of religious reform for which Cisneros strove so earnestly in Spain. Intent on this end, its founder prohibited the teaching of Civil Law, on the principle that this study was effectively provided in other universities; and he affirmed explicitly that the studies established in his schools were intended to be ancillary to Theology. The conception that Cisneros had of the education of a theologian was ample enough, since the Chairs founded by the first statutes of 1510 were: three in Theology, one in Canon Law, four in the Arts, three in Latin and various other tongues, and two in Medicine. These were added to by the new Constitution promulgated by the founder in 1517, and took the following form: three in Theology, two in Canon Law, eight in the Arts, one in Rhetoric, six in Latin, several in languages, and two in Medicine. The schools in languages—Greek, Hebrew, Chaldean, and Arabic—were established "in order better to sow abroad the Word of God."

It is a common belief that the University of Alcalá came into being as a rival of the University of Salamanca, the representative of the mediaeval spirit; while the University of Alcalá represented the new spirit of the Renaissance. This is not correct. Before the University of Alcalá was founded, the classic Renaissance had entered Salamanca with Antonio de Nebrija, Arias Barbosa, and others. No Chair established in Alcalá but had its corresponding Chair in Salamanca; and, indeed, many of the best professors taught alternately in both universities. Cisneros did all that was possible to attract to his university the best professors from Salamanca, and was successful with a few, such as Nebrija, Pedro Ciruelo, and Alfonso de Zamora; but some, after having taught for a certain time in Alcalá, among them Nebrija and Hernán Núñez, voluntarily returned to Salamanca.

The Polyglot Bible of Alcalá. Much of this confusion of ideas is due to the fact that the beginnings of the University of Alcalá are intimately connected with another great work which was brought to a successful issue by the energy of Cisneros—the compilation of the Polyglot Bible of Alcalá—the greatest monument of Spanish Humanism and the most worthy contribution of Spain to the Christian Renaissance.

Some of the philologists whom Cisneros gathered together for the compilation of his Bible remained, as teachers, at the university, such as the Greek professor, Demetrius of Crete, and the two

successive professors of Hebrew—Alfonso de Zamora and Pablo Coronel. The choice of these professors, and the intellectual force which the Polyglot edition of the Bible represented, gave to the University, while its founder lived, a brilliancy hitherto unknown in Spain, and evoked many hopes and much praise from Erasmus. But the University never succeeded in surpassing the fame it attained almost at birth. On the contrary, signs of its decadence were apparent at the death of Cisneros, and dogmatic Theology and Canon Law—as in the case of Salamanca—maintained their domination during that century and won praise at the Council of Trent. The study even of the Sacred Scriptures at the very place where the Polyglot Bible was compiled suffered a decay so evident and so rapid, that in the second half of the sixteenth century no professor worthy of mention was to be found there; while, in Salamanca, Friar Luis de León, Grajal, and Cantalapiedra gave lustre to those studies in a strenuous controversy with the scholastic theologians.

Nay, more. The reforms introduced into the University during the sixteenth and seventeenth centuries, after the death of Cisneros, were but significant of a progressive deviation from the founder's ideas and declension to the type of the Salamanca University, by the increase of the faculties of Canon Law (which came to predominate over Theology), of Medicine and of Theology (by the establishment of an interchange of professors between the different theological schools).

Modern Developments. The great decadence of the seventeenth century, common to all universities, which it was sought to arrest by the reform introduced by Dr. Medrano in 1666, only succeeded in completing the deviation from the primitive foundation by the introduction of civil law; until, at length, by the reform which the Visiter Granados effected in 1748, the jurists predominated in the University.

With regard to the eighteenth century, when the reforms introduced by the Central Government took effect, it is only necessary to repeat what has already been said in the article on the University of Salamanca (*q.v.*). In 1771, the internal dissensions of the Council resulted in the Plan of Studies associated with the name of the Count of Aranda (see ABARCA OF BOLEA), which was very similar to that conceded to the sister University of Salamanca. It is only necessary to advert to the fact that so marked was the inertia and the reactionary spirit at Alcalá, that the suppression of the University was proposed by Quintana in the Cortes at Cadiz. The University of Alcalá was, in fact, crushed by the growth of the large number of scientific and didactic institutions which the Bourbons had created in Madrid during the eighteenth century. From the unification of these institutions, the University of Madrid spontaneously arose and took bodily form, in 1821, by the creation of the Central University. In 1823 the University was brought back to Alcalá, until, in 1836, it was again translated definitively to Madrid, although this removal did not mean the transference of its traditional characteristics, but a reconstruction on new bases.

F. DE O.

(See also SPAIN, THE RENAISSANCE IN.)

ALCHEMY.—(See CHEMISTRY, HISTORICAL DEVELOPMENT OF.)

ALCOHOL.—Our nation, only during the last few years, has become seriously alive to its responsibilities towards its children, who will constitute the future people and citizens of the centre of the British Empire, and whose education and physical welfare ought to be its first care. But, thanks to the untiring insistence of our Medical Officers of Health, the term "infant mortality" does now, at any rate, convey to a considerable number of people that there exists a hideous blot on our civilization, namely, the yearly slaughter of infants under 12 months of age, and the weakening of many thousands more, by conditions of social living, poverty, and disease—conditions most of which are wholly preventable. Foremost of these child-destroying evils is the drink trade, and the purport of the following paragraphs is to outline the injuries which the widespread traffic in alcoholic drinks inflicts upon the fathers, the mothers, and the children of the nation, and to show how education is paralysed by the consequent imperfection of the instrument it is its chief duty to train, namely, the nervous system of the child.

A. Alcohol and Parentage. (1) **ANTE-NATAL CONDITIONS.** As Dr. Saleeby, our most skilful exponent of the science of Eugenics, has truly said: "The protection of parenthood from alcohol is, and must be, recognized by every Ministry to be the prime duty of the State." Unfortunately, as recent events have shown, the grip of the drink trade on the Legislature is such that, though Mr. Lloyd George, when Munitions Minister, declared it to be the nation's greatest danger in the Great War, the Government nevertheless withdrew the anti-alcohol legislation it had introduced, and, instead of its comprehensive measures designed to protect the childhood and parenthood of the nation from the drink traffic, resorted to a spasmodic application of a quasi-martial law. Since constitutional law has so far failed, every effort possible on the part of educationists is necessary at this juncture to press forward the anti-alcohol reform of the nation's habits by reasoned instruction. Fortunately, the scientific facts on this special branch of national socio-economics are so numerous and direct, that nothing save vested interest can withstand the force of their truth. It is not necessary to state here the proofs that even small quantities of alcohol affect injuriously the tissues of an adult man or woman—the parents of the nation—for these are all given at length in various monographs. Of course, too, the destructive effects of alcohol in small doses upon the delicate tissues of a child are fairly well understood, though frequently deliberately ignored by parents, who (in spite of the Children's Protection Act) give their children wine or beer. But it is the duty of our Public Education Authorities throughout the country to make it clear to the people that the future well-being of the nation depends on their taking care to defend the children from harmful agencies, and not only those arising after birth, but also before birth. For as the distinguished Russian physiologist Bunge urged, since it is admitted that the growing tissues of a young child are delicate, how much more delicate is the ovum or maternal element which is not even yet formed into an individual being, and is so easily damaged or destroyed by infinitely small quantities of drugs, especially alcohol. What is true of the germ element of the mother is equally true of that of the father. It has been known for

many years that alcohol taken by the father affects his offspring adversely; but, quite recently, Bertholet has also discovered that there is a direct degenerative and wasting effect produced by alcohol on the germ element in the father. Further, a large amount of research has been carried out in answer to the question, "What actual influence does alcohol exert on the developing embryo before birth?" To solve this point, many exact experiments have been made with minute doses of alcohol on the eggs and just-hatched embryos of animals of all classes (fish, reptiles, birds, etc.), as well as on the parents of various generations of domestic animals, chiefly the guinea pig, rabbit, and dog. These experiments, in all countries and in the hands of different observers, have all given the same unequivocal result, namely, that the first ill effect of very small quantities of alcohol on the growing embryo is the causation of defects of development in the most completely evolved and delicate tissues of the nervous system. The parts which suffer first and most severely are the highest part of the brain, and the most important sense-organs—the eye and the ear. Thus, from the standpoint of national education, alcohol is the most destructive and inimical agent conceivable against the training of a healthy, vigorous, and intellectual people, because it is a poison, whose selective action is exerted upon those sense-organs, the perfect integrity of which is essential for education. [All poisons have a specially injurious action (spoken of as "selective") on certain of the body tissues (*e.g.*, strychnine attacks the spinal cord, alcohol the highest centres of the brain, atropine the involuntary muscles, etc., etc.).] As regards the part of the brain first attacked by alcohol, the structural elements found wanting in the brains of defective children, and in the offspring of animals to whom small quantities of alcohol have been given in their food, are the delicate cells and fibres in the highest layers of the surface of the brain, which are termed association fibres, because they subserve the co-ordinative interaction of the nerve centres, and, therefore, must assist in the association of sensory impressions, and hence constitute an important part of the physical substratum of the mechanism for the formation of ideas. The absence or the deficiency of these structures determines the occurrence of idiocy, imbecility, or simple stupidity in a child who has thus been rendered helpless by its progenitors even before its birth. As regards the alterations produced in the eye or ear of the offspring by alcohol through the parents, these consist in all degrees of malformation and, sometimes (especially in the lower animals), complete absence. In man the effects of alcohol, summed up by Professor Edgar, on the foetus (the unborn child) are shown in the extraordinary tendency to nervous and cerebral disease, malformation, and degeneracy in the child. Thus, the evidence of direct ante-natal injury of the unborn child due to the alcohol taken by its parents is complete.

(2) **ANTE-NATAL AND POST-NATAL CONDITIONS.** The evidence of injury to children after birth caused by parental alcohol-taking is, of course, not controlled by experimental observation, but it is as conclusive and as definite as that just considered, being chiefly derived from the socio-economic facts of State Medicine as follows. The general fact that alcohol is primarily responsible for the post-natal death of many thousands of children just after birth and during the first twelve months of life has

been finally established by the Reports of the Medical Officer of the Local Government Board, (now the Ministry of Health), in which Dr. News-holme has shown that the curve of infant mortality rises and falls with the increase and decrease respectively in the consumption of alcohol by the nation.

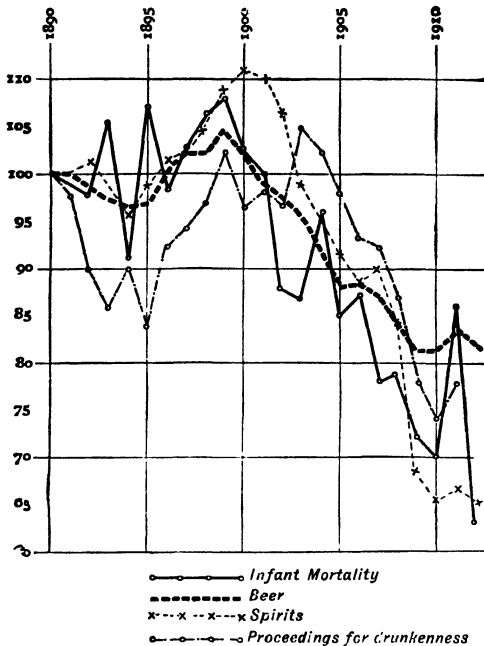


DIAGRAM COPIED FROM THE SECOND REPORT OF THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD ON INFANT MORTALITY.
CD. 6909 (1913),

showing the close relationship between Alcohol and Infant Mortality.

That the alcohol custom is the prime factor [see the accompanying figure taken from Cd. 6909 (1913)] is thus obvious, but we must now analyse the general conclusions embodied in these facts. In the first place, a part of the intimate correlation between alcohol and infant mortality is due to the fact that the drink traffic is the chief cause of the spread and dissemination of syphilis and other venereal diseases which potently injure and destroy infant life. For, as all medical and legal experience (*cf.* especially Mr. Justice Bargaive Deane's evidence to the Divorce Commission) shows, immorality and, consequently, venereal infection is mainly due to the loss of self-control which results from so-called moderate drinking of alcohol. It should be fully understood, further, that this close association between the drink traffic and venereal disease is, strangely enough, also emphasized in another way; namely, that, like alcohol, these diseases, where they do not kill, attack the brain and eye especially, and are, therefore, also specially destructive against education, being, like alcohol, productive of much hereditary disease of the nervous system, idiocy, mental dullness, defects of sight (including often complete blindness) and of hearing. In the second

place, the general want of education of the people in the elements of healthy physiological life has allowed the fatally false belief (sedulously fostered by the brewers) that alcoholic drinks are "strengthening," to be put before the mothers of the nation every day. It is not only the child-bearing mothers who thus unconsciously poison their unborn infants, but also the nursing mothers, in whose milk chemical analysis has demonstrated the presence of alcohol when even only a small dose has been swallowed. Fortunately, the syllabus of the Board of Education on Hygiene and Temperance is a step towards the emancipation of the people from their alcoholic servitude. Much, however, remains to be done; and the patriotic sympathy of all school teachers, the vast majority of whom have done so much already to raise the ideals and improve the physique of the nation, must be obtained. In the third place, the post-natal injuries inflicted by alcohol through the parent on the child and on its capacity of educational receptivity must be discussed from the standpoint of the protection of family life, and in the light of the facts revealed by the Local Government Board's reports on infant mortality.

B. Alcohol and Childhood. The developing child, especially during the first years of its life, requires cleanliness, care in feeding, warmth, rest, and sleep. The absence of these factors produces what is commonly spoken of in school technology as "malnutrition." Parents who take alcohol are indifferent and apathetic towards these essential requirements of the child's life. Consequently, the child of school age exhibits the effects of neglect and want of rest. Its poorly developing body, its lack of teeth, its miserably poor resistance against disease are well known, though it is seldom recognized, and never admitted, that alcohol is in any way the cause of the child's condition. Yet it is precisely this decadent condition of the child which constitutes the primary difficulty of the teachers in elementary education. They know that mental dullness, inattention, fidgetiness, weariness, and emotionalism are the natural attributes of a child whose parents have begun the day with a drink and sent the child to school without any breakfast. A worse effect of alcohol in the parents is that in which the indifference it generates in them by its narcotic influence gradually develops into cruelty. The appalling records of the Society for the Prevention of Cruelty to Children prove that the ill-treatment, torture, and sometimes murder of the 160,000 children which its work reveals every year to be so injured, are due almost entirely (96 per cent.) to the alcohol trade.

From the standpoint of national education as well as humanity, it must also be realized that these figures only lay bare but a small part of the distress by which the children of the nation are harassed through the alcohol traffic, for the above-mentioned total, enormous though it be, only expresses the number of instances actually discovered and dealt with in the courts of justice. The effect on a child of harshness and of cruelty is paralysing as well as degrading; the child's capacity of profiting by education is diminished, while the disorder of its nervous system is great, and commonly affects it for its lifetime. Alcohol, therefore, in this aspect of domestic life inflicts a further injury on national education, for any training in citizenship is defective unless founded on a sound home life, by which alone the principles of sympathetic social civilization and humanity can be established.

The home habits among the better-off classes of taking alcohol as a daily custom at meals is a national danger to all children, and young adolescents passing through school to business and college life. Constant familiarity in the use of the drug shuts out all idea of its evils, and the child's subsequent failure in life or at the university is really due to the failure of its parents in their home life.

Another, and the most direct, injury to education caused by alcohol is the direct depression of intelligence which children suffer to whom alcohol is given as part of their diet under the fatal error that it is "good for them," or as a so-called "pleasure."

A careful inquiry in various countries has established the existence of this serious evil, the abolition of which is essentially a physiological truism, but even now is so little realized, that in some secondary schools the pupils are allowed beer or other alcoholic drinks. By special inquiry in American schools, mental dullness, premature fatigue, and weariness were directly traced in the children to their being given alcohol at meals or otherwise. Abroad, in Germany, Austria, and Switzerland, where wine is frequently given to children as a daily beverage, experimental research proved that it caused not only the educational drawbacks just mentioned, but that it was provocative of restlessness in sleeping or waking and general nervousness.

On this last point too much stress cannot be laid, since education means the cultivation of self-control, and the establishment of a balanced judgment by training the highest centres of the brain, which, as we have already seen, are the first to be attacked by alcohol even in small so-called dietetic doses.

Finally, it must not be forgotten that, coupled with the special mental deficiency and stagnation produced in children by alcohol, there is also the fundamental injury inflicted by it on the tissues and vital chemistry of the growing and developing child. The stunting of the growth of the children in our cities is largely due to the widespread use of alcohol in the community, as well as to the chronic underfeeding which the children suffer from, not only because of the lack of a living wage, but also because the money for their food has been given to the brewer and distiller to satisfy the cravings of their parents. To conclude, it has been impossible within the necessarily restricted limits of this article to present more than a mere sketch of this great subject; but, from the point of view of scientific eugenics, there is no question but that the interests of parenthood and childhood are sacrificed so long as the custom of habitually taking an opiate like alcohol remains as a blight on the lives of the majority of the British people.

V. H.

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ALCUIN (originally Ealhwine).—He was born at York in 735, and educated in the Cloister School at York under Albert of York (*q.v.*), with whom he travelled in order to broaden his outlook. When Albert became Archbishop of York in 766, Alcuin had charge of the school and its rich library,

which was bequeathed to him by Albert on his death. In 781, Alcuin was sent to Rome to fetch the pallium for Eanbald, the new Archbishop of York, and, as he was returning, he met Charlemagne at Parma. Charlemagne was then organizing education in his vast empire, and begged Alcuin to help him. Having obtained permission from the English Church, Alcuin settled at Aachen (*Aix-la-Chapelle*) and devoted the remainder of his life to Charlemagne's service.

For the next eight years, Alcuin was engaged in educating members of Charlemagne's family, and even Charlemagne himself attended his lectures. Some of Alcuin's books, still extant, on grammar, logic and other educational subjects, give us some idea of his system of instruction, which was generally by dialogues and conversations—a catechetical system based on still older styles of teaching.

In 790, Alcuin was sent to England to arrange terms of peace between Charlemagne and the King of Wessex, and stayed in England two years. After 792, Alcuin became engaged in controversies on the subject of heresy; and, as a result, left the court of Charlemagne and became Abbot of Tours, taking charge of the School of Tours. He still, however, continued to be Charlemagne's educational adviser till his death in 804.

Alcuin is noted as the foremost man of letters in the restoration of teaching under Charlemagne. He was a teacher rather than a writer, and his writings include elementary books on grammar, rhetoric, dialectics, and orthography; also some essays, Biblical commentaries, and lives of saints. Alcuin's letters are of high interest for the light they throw upon contemporary literary and social history.

ALDENHAM SCHOOL.—(See LONDON CITY COMPANIES AND EDUCATION, THE.)

ALDHELM.—He lived during the last sixty years of the seventh century and died in 709; being probably a son of Centwine, king of the West Saxons. As a child, he was taught by Maldulf (or Meldum), a learned Scot, who settled at, and gave his name to, Malmesbury (Meldum's byrig). After the coming of Theodore (668), Aldhelm went to be taught by him in the new schools at Canterbury, and on his return to Malmesbury gained his living by teaching. He became Abbot of Malmesbury and was soon known as one of the most learned men of the day. He was a leader in the intellectual movement to extend learning at a time when learning flourished in England alone among the countries of Western Europe.

He was especially skilled in both instrumental and vocal music, and used his vocal powers to attract his congregations. Alfred praises Aldhelm's poems, none of which now remain; and William of Malmesbury says that most of his writings were Latin treatises. As an architect, he built many churches in and near Malmesbury, one of which—St. Laurence, at Bradford—still remains.

In 705, he became Bishop of Sherborne, and made frequent pastoral journeys through his diocese; and, upon one of these visits, died in the church at Doulting, Wiltshire. A few of his works are still extant, including *De Laude Virginitatis*, in praise of convent life. This was much commended by Bede, and was reprinted many times in the fifteenth and sixteenth centuries.

ALDUS, MANUTIUS (Aldo, Manuzio).—He was born at Sermoneta, in Italy, in 1447, and was educated at Rome and Ferrara, which he left when it was besieged by the Venetians in 1482. He lived under the patronage of Alberto Vero, the lord of Carpi, and with the assistance of his patron, he set up a printing press at Venice about 1488. His first publications appeared in 1490, and Aldus soon surpassed all other printers of the time by the accuracy, beauty, and copiousness of his work. He spared no expense in obtaining the best manuscripts, and gathered around him a large company of learned men, who met regularly at his house and formed an academy there. All the work was done in Greek, even the instructions to the type-setters being given in that language, and Greeks carried on his trade.

Aldus collected a vast store of Greek manuscripts, and his own extensive knowledge of Greek language and literature enabled him to prepare for the press a rapid succession of volumes from 1490 until his death in 1515. A Greek psalter is said to have been the first book he printed; but, in 1498, he had printed five volumes of Aristotle, nine comedies of Aristophanes, and many of the works of Herodotus, Sophocles, Xenophon, Euripides, Demosthenes, and Thucydides.

In 1506, the League of Cambray attacked Venice, and Aldus was compelled to leave the city for six years, his property being plundered.

The Aldine editions were very famous in their day, and are still preserved as literary curiosities. After the death of Aldus, his successors carried on the work, and, besides Greek texts, published many Latin and Italian classics.

ALERTNESS [Italian, *all'erta* (on the watch)].—Readiness to observe, to grasp facts, and to use them.

ALEXANDER III, POPE (1159–1181).—Pope Alexander III, who died in 1181, had a notable influence on what may be called the Anglo-Norman Renaissance of the Twelfth Century. He was an educational thinker and worker. In England, during the century before his death, the Norman scholars, beginning with Lanfranc and Anselm, had had great influence: education had been placed on a firm diocesan basis, and the Universities of Oxford and Cambridge had come to life. Among the educational reformers was the notable figure of Henry de Blois (grandson of William the Conqueror), Bishop of Winchester from 1129 till his death in 1171. A letter is extant (undated, *Corpus juris Canonici*, Vol II, column 768) almost certainly from Alexander to Henry, which said: "In future, be more careful to see that nothing be demanded or even promised for the license to teach anyone. If hereafter anything is either paid or promised, take care that the promise is remitted and payment restored, such charge being null and void—knowing what is written, 'Freely thou hast received, freely give.' Indeed, if any one by reason of such a prohibition delay the institution of masters in fit places, you may, by our permission, disregarding or gainsayings or appeals, appoint in such places for the instruction of the people, prudent, honest, and discreet men." The letter must have been written between 1159 and 1181; and, as ecclesiastical affairs in England were in chaos between 1171 and 1181, it seems almost certain that it was written by the great educational

Pope to a man of whom a monk of Winchester wrote under the date 1171: "Henry, Bishop of Winchester, than whom never was man more chaste or prudent, more compassionate or more earnest in transacting ecclesiastical affairs, or in beautifying churches" (*Annals of the Church of Winchester*, 633–1277; ed. J. Stevenson, 1870). The direct result of the letter was not seen till the year 1200, when Canon VIII promulgated by the General Council at Westminster ordained: "Let nothing be exacted for license to priests to perform divine offices, or for licenses to schoolmasters. If it have been paid, let it be restored." The relations between Henry of Blois and Alexander III forms an important chapter in the history of education which has not yet been fully explored. J. E. G. DE M.

ALEXANDRIA, SCHOOLS OF.—In 332 B.C., Alexander the Great traced the plan of the new city of Alexandria at the mouth of the western branch of the Nile. For many centuries afterwards, this city was the grand emporium of Europe, Africa, and India, and also the principal centre of intellectual life of three continents. The city was famous for the regularity of its plan, its colossal public buildings, and the beauty and solidity of its private houses.

Grecian literature had reached its highest point of perfection about the time of the founding of Alexandria, which, as it grew into a great commercial centre, became, under the munificence and favour of the first Ptolemies, also the chief seat of learning. Here literature became a profession, and was supported by the establishment of noble and extensive libraries. A race of grammarians and critics arose, who bestowed critical care on editions of the best authors and introduced for the help of students improved systems of grammar and punctuation. Aristophanes of Byzantium, chief librarian under the second and third Ptolemies, founded a school of grammar and criticism, and was one of the most eminent scholars of the city.

Aristarchus edited the Homeric poems in the form in which we now know them. Theocritus, the most admired and the earliest of ancient pastoral poets, lived some years at Alexandria under the patronage of Ptolemy II. His style was imitated by Bion of Smyrna, Moschus of Syracuse, and Virgil and Tibullus of Rome. Callimachus flourished at Alexandria as a writer of hymns, elegies, and other poems, and was imitated by Catullus and Propertius at Rome. Among Alexandrian writers of science, the most famous was Euclides, the mathematician, whose elements of geometry have formed for so many years the basis of geometrical teaching. He flourished under the first Ptolemy (323–283 B.C.). Euclides was the founder of the mathematical school of Alexandria, and among his pupils were Archimedes, who made important discoveries in mechanics—including the famous Principle of Archimedes; Apollonius, who wrote a work on conic sections; Hipparchus, who catalogued the stars; and Eratosthenes, who wrote on astronomy, geometry, and geography.

The school of philosophy included Plotinus, who founded the Neo-Platonic system; Porphyry; and Proclus. The famous Alexandrian Library was the largest collection of books in the ancient world. It was founded by Ptolemy I, and in its prime is believed to have contained 700,000 volumes. Part of the library was kept in the museum and part in the temple of Jupiter Serapis. The destruction

of the library was commenced by a mob of fanatical Christians in A.D. 391, when the temple was stormed and destroyed. The destruction was completed in 641 by Arabs under the Caliph Omar.

ALEXANDRIAN SCHOOL.—(See MATHEMATICS, THE HISTORY OF.)

ALFRED THE GREAT (871-901).—King Alfred, having obtained peace in 879 by his treaty with Guthrum, and acquired his title "the Great" by the skilful diplomacy and wise foresight which enabled him to convert the hostile Danes into peaceful loyal Englishmen, found at his disposal time and opportunities to restore religion and education to his subjects. He found a condition of profound ignorance throughout the country, and in restoring and re-establishing monasteries he was careful to make them centres of education. As almost all literature of the day was in Latin, he promoted the teaching of that language, but devoted more attention to the provision of literature in the language of the country. He, therefore, caused translations to be made of books which had been most valued by earlier teachers, such as Aldhelm, Alcuin, and Bede. He made some of these translations himself, including Bede's *Ecclesiastical History*, the *Universal History* of Orosius, Boëthius's *Consolations of Philosophy*, and Pope Gregory's *Book on the Care of the Soul*.

The *Universal History* of Orosius was much used as an historical manual in monastery schools; and Alfred selected such parts as, being free from religious argument, would be most useful in teaching history and geography. He also added passages on the geography of Northern Europe, and sketches of voyages round the North Cape, and round Denmark, made by Ohthere, a Norwegian explorer, and a voyage of Wulfstan from Slesvig to Truso, in Prussia.

Alfred also promoted the establishment of a national record of events which has been handed down to us as *The Anglo-Saxon Chronicle*, and which gives, from 851, a useful record of English history, year by year, to 1154. The Chronicle commences with Caesar's invasion and gives brief chronological notes from that time to 850.

ALGEBRA, THE TEACHING OF.—Modern opinion is agreed that instruction in the methods of algebra should first be introduced informally in lessons in arithmetic. Opportunities of two kinds arise: (1) In many cases, the solution of an arithmetical problem may be simplified by the use of an abbreviated word or a single letter to represent the unknown value which is sought. By simple arguments, the beginner may be shown that this symbol for an undetermined number may be treated as if it were a determined number like 8 or $3\frac{1}{2}$. (2) Still more frequently (for example, in mensuration) the pupil will find it useful to set down at the head of the working of a problem an abbreviated statement of the rule he is to follow. It is easy to show that the most convenient form of statement is a *formula*, in which the several verbal phrases involved in the rule are represented each by a single letter.

Formal lessons in algebra may take their start from either of these simple practices. Most authors of modern text-books start from the former, and devote their first lessons to *simple equations*. Others (including the present writer) hold that it is better

to begin with the second. The arguments for this view are, briefly, (1) that the study of simple equations at this stage rapidly leads to *problems* of an artificial character—little better, in fact, than mathematical conundrums; while (2) practice in the writing and use of formulae shows the beginner the "good" of algebra by exhibiting its practical usefulness, and (3) leads more naturally to the study of the fundamental forms of algebraic manipulation.

Whichever line of attack is followed, the manipulative processes to be mastered in the first year's course should include: (a) simple cases of factorization; (b) simple cases of the reduction of fractions; (c) the process which the present writer has called "changing the subject of a formula." These will be considered *seriatim*.

(a) It may be taken as a fundamental principle that algebraic processes should not be taught merely as "rules," but should be presented by methods that make their meaning and usefulness apparent to the pupil. In teaching the uses of brackets and factorization, this principle may be applied in more than one way. If the treatment is based upon the study of equations, the simple uses of brackets enter very naturally at an early stage, while the factorization of the second degree expressions may be introduced as a means of solving simple quadratic equations. If the construction and use of formulae are the central topic, brackets will be introduced very early as a natural algebraic "idiom" or mode of symbolic expression. A little later, factorization may be taught as a means of throwing a formula into the shape most convenient for arithmetical substitution. Suppose, for example, that a formula is required for calculating the weight, W , of metal in a pipe l feet long, the external and internal radii of the pipe being R and r feet respectively, and the weight of the metal w lb. per cubic foot. The first formula written by the pupil will probably be—

$$W = (\pi R^2 - \pi r^2)lw$$

which, by an obvious step, may be improved into

$$W = (R^2 - r^2)\pi lw.$$

But the pupil who can factorize $R^2 - r^2$ possesses a means of making his formula still more convenient for practical computation, and will write it:

$$W = (R + r)(R - r)\pi lw.$$

Whichever of these methods of dealing with factorization is followed, the forms considered will be few and simple, being limited to those which are of direct service in dealing with elementary problems. All further study of "identities" should be postponed to a much later stage. It may be added that the transformations effected by factorizing are made much more intelligible if illustrated by simple diagrams or models.

(b) Most of what has been said about factors holds good of fractions. The process of "simplifying" a fraction should be justified by showing either that it is a necessary step in the solution of many equations, or that it enables a formula to be thrown into a shape more convenient for computation. The application of either of these principles limits the pupil's consideration at this stage to the fractional forms that actually occur in practical problems.

(c) The use of the formula quoted under (a) presupposes that numerical values of R , r , w , and l are given, and that the value of W is to be computed from them. Now suppose that a formula is required by which the value of r may be calculated

when values of R , W , w , and l are given. This problem may be solved in two ways: (1) The pupil may think out the relations between the variables afresh without reference to his previous work, and thus reach the required formula directly; (2) on the other hand, he may, without further reflection upon those relations, derive the required formula from the former one merely by the faithful application of a few rules of manipulation. These are exhibited in the following steps—

$$\begin{aligned}(R + r)(R - r)\pi lw &= W \cdot \\ (R^2 - r^2)\pi lw &= W \\ R^2 - r^2 &= \frac{W}{\pi lw} \\ R^2 - \frac{W}{\pi lw} &= r^2 \\ r &= \sqrt{R^2 - \frac{W}{\pi lw}}\end{aligned}$$

This is the process of *changing the subject of the formula*—here from the variable W to the variable r . The necessary rules of manipulation are, of course, those required for the solution of simple equations, and are best learned in connection with equations. For this purpose, it is unnecessary to spend time upon artificially complicated problems; the teacher will find it far more profitable to give his pupils familiarity with “changing the subject”—a process which, besides being of fundamental importance in the practical applications of algebra, is constantly required in all branches of mathematical analysis.

Numbers in Algebra. So far, it has been tacitly assumed that the numbers which the pupil has been taught to represent by literal symbols are the signless numbers of arithmetic. Sooner or later, however, he must learn that the further development of algebra requires the introduction of numbers which include a positive or negative sign.

For the sound teaching of algebra, nothing is more important than a proper understanding of the nature of these numbers and of the reasons for their use. The essential thing to remember is that positive and negative numbers are “directed” numbers, that is, they may always be thought of as indicating a series of positions along a linear scale, the positive numbers running, in order, in one direction, and the negative numbers in the opposite direction from the position taken as the zero of the scale. With this conception, the terms of a “sum” $a + b$ may be thought of as describing movements taken in succession forwards or backwards along the scale, starting from zero; the value of the sum being the single movement which would produce the same ultimate displacement as the combination. Thus, if $a = +7$ and $b = -12$, the sum $(+7) + (-12)$ is obviously -5 . To interpret $a - b$, we must suppose that a represent the ultimate displacement from zero produced by two successive movements of which the first is b , the “difference” sought being the second movement. In the case of $(+7) - (-12)$, it is obvious that if we have started by taking a movement of -12 from zero, we can reach $+7$ only by taking a second movement of $+19$. By such arguments, the *rule of signs* may be established for algebraic addition and subtraction.

The interpretation of a product whose factors are directed numbers requires a different argument. The following exemplifies a suitable method.

Let vt be the distance travelled in t hours by a train going at v miles an hour. Let the train in a special instance be moving *southwards* at 40 miles an hour, and let its position be required 3 hours *before* the moment taken as zero. It is convenient to represent these data as -40 and -3 respectively, in which case the answer to the problem is, by hypothesis, $(-40) \times (-3)$. But since the train, at the specified moment, would have been 120 miles to the *north* of the point taken as the zero position, the product must be considered to be $+120$; that is, the product of the two negative numbers is positive.

The above examples may be used to bring out the advantages as well as the meaning of directed numbers. It is evident, for instance, that if a and b are non-directed or signless numbers, the difference $a - b$ exists only so long as b is not greater than a . But if a and b are directed numbers, there is a calculable difference whatever their numerical values may be. In other words, the introduction of directed numbers brings an enormous increase in the “generality” of algebraic expressions and formulae.

The same principle justifies the introduction of the numbers usually called “imaginary,” but much better named “complex.” It is well known that two directed numbers (say p and q) can always be found to satisfy the quadratic equation $ax^2 + bx + c = 0$, provided b^2 is not less than $4ac$. If this condition is not fulfilled, roots can be found only if we suppose them to be of the form $m + in$, where m and n are directed numbers and the symbol i may be treated as if it were a number whose square is -1 . It is not difficult to show that just as the directed numbers m and n may be regarded, individually, as marking points on a line, so the combination $m + in$ corresponds to a point in space whose rectangular co-ordinates are m and n . The demonstration of this fact removes the mystery from “imaginary” numbers, just as correspondence with positions on a line makes negative numbers (which learned mathematicians of the eighteenth century considered “impossible numbers”) perfectly intelligible.

Functions. A brief acquaintance with formulae that describe the behaviour of real things (as do those used by engineers) shows the beginner that, though the variables involved in them may be extremely various in character, yet the same *forms* of connection constantly recur. For instance, many formulae are of the form $y = ax + b$; many others of the form $y = ax^2$. The study of these typical forms of connection between variables is undoubtedly one of the most important elements in algebra, and should receive careful attention. (It is useful to reserve the symbols x and y for use in these “generalized formulae,” the other letters being used in formulae which describe the behaviour of particular variables.) The treatment must, of course, be confined to the simpler functional forms, and should gather in all the really vital material usually taught under the headings “proportion” and “variation.” It is in this connection that “graphs” play their most useful part, since the study of functional forms is greatly illuminated by consideration of the curves to which the algebraic forms correspond.

Though they differ as to the details of their exposition, many modern writers hold that the theory and use of logarithms may best be taught in connection with the study of the “exponential

curve." This amounts to treating logarithms as a special instance of functional connection.

Beginnings of the Calculus. Of late years there has been a strong tendency to lay less stress than formerly upon the cultivation of manipulative skill, in order (1) that more attention may be given to fundamental principles, and (2) that room may be found for new elements of more value than those expelled. Of the novelties proposed under (2), by far the most important is a simple introduction to the ideas and methods of the differential and integral calculus. Most recent text-books include an informal treatment of differentiation—generally presented as the problem of determining the "gradient" of a given curve. The present writer has advocated a rudimentary course of integration based upon the pioneer methods of John Wallis (1655). T. P. N.

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ALGEBRA AND GEOMETRY, THE INTER-RELATIONS OF.—(See GEOMETRY, THE TEACHING OF CARTESIAN.)

ALGERIA, EDUCATION IN.—(See FRENCH COLONIES, EDUCATION IN.)

ALIGARH, THE UNIVERSITY OF.—(See MOHAMMEDAN EDUCATIONAL MOVEMENTS, MODERN.)

ALGOMETER (measurer of pain).—An instrument used to test the sensitiveness of the skin to pain by means of the pressure of a blunt point.

ALGORISM (also Algorithm, Angrym, Awgrim).—A name used in the Middle Ages for the art of computation by methods other than the use of the abacus (*qv*). The word is derived from Al Khowâresme (*i.e.*, native of Kharesme), a title applied to Mahommed Ben Musa (9th century), who wrote an Arabic treatise on computation. The Latin title of this work is *Liber Algorismi*.

ALKAHEST.—(See CHEMISTRY, HISTORICAL DEVELOPMENT OF.)

ALLEN, WILLIAM (1770-1843)—A famous scientist and philanthropist who taught science and philosophy, was a member of the Linnean Society, and lectured at the Royal Institution. For many years he strove to obtain better conditions for the poor, and co-operated with those who secured the abolition of slavery. He was one of the founders of the British and Foreign School Society, and for many years its treasurer. He travelled in many countries of Europe, visiting hospitals and prisons, and appealing to rulers on behalf of the ignorant, destitute and oppressed.

• **ALLEYN, EDWARD** (1566-1625).—This actor and educator was born in the parish of St. Botolph's, Bishopsgate. He adopted the stage as a profession, and by 1592 had become an eminent actor, appearing in Green's "Orlando Furioso," Marlowe's "Jew of Malta," and many of the first performances of

Shakespeare's plays. In partnership with Henslow, his father-in-law, he built the Fountain Theatre in Golden Lane (1600), and occupied it as head of the Lord Admiral's company of actors which was taken over by Prince Henry after the accession of James I. With the wealth acquired by successful acting, Alleyn bought property in Kennington, Southwark, and Sussex; and during the years 1605-1614 he acquired the whole of the manor of Dulwich. Removing to Dulwich he began to build the College, with school-house, chapel, and almshouses, and obtained from James I a royal patent for the incorporation and endowment of the charity, naming the institution the "College of God's Gift." From this time (1619) till his death in 1626, he personally managed the affairs of the College. During these years he associated with the nobility, patronized poets, and had an interest in various theatres. At his death, he left provision for the building of almshouses in Bishopsgate and Southwark, and left leases in Southwark to the Colleges.

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ALLIGATION.—A branch of arithmetic which deals with mixtures and compounds consisting of ingredients differing in values. The simplest problems are to find the values of mixtures of various quantities of ingredients (*e.g.*, different kinds of tea) varying in price. Other problems frequently arise, such as the following—

1. The values of the ingredients and of the mixtures being given, to determine the quantities.
2. The values being given and a limit put on the quantities of some of the ingredients, to determine the quantities of the other ingredients.

ALLOCHEIRIA (*allos*, other; *cheir*, hand).—A symptom in certain nervous diseases, in which a sensation in one part of the body is transferred to the opposite part. For example, a pin-prick on one hand is felt on the other.

ALMA MATER.—A Latin phrase meaning "the nourishing mother." It is a term applied to one's university, as the mother which fosters and nourishes the intellectual powers.

ALMAGEST.—A collection of astronomical and geometrical problems compiled by Ptolemy, the Egyptian astronomer, in the second century A.D. It contained the Ptolemaic theory of the solar system, according to which the sun revolved round the earth and the planets round the sun. (Arabic, *al*, the; Greek *megistos*, greatest.)

ALMANAC.—A book containing a calendar of the year, with information on astronomical, ecclesiastical and other matters connected with the days, months and seasons. Official almanacs are published by the governments of countries; others, such as *Whitaker's Almanac* and *The Statesman's Year Book*, are published by private firms, and contain a mass of information on current affairs. The earliest almanacs were largely devoted to forecasts of events, as, for instance, *Old Moore's* and *Zadkiel's*. The official British almanac is the *Nautical Almanac*.

ALPHABET, INTERNATIONAL.—An International Alphabet which could be representative of all the sounds met with in the many tongues of mankind, would need to contain several hundred different characters. These could, of course, be provided from the different founts in the stocks of any well-equipped printing establishment, but the printed pages would be bizarre and inartistic in

SCRIPT FORMS OF SPECIAL PHONETIC LETTERS.

l	l	f	f	j	n	r	e	e
c	c	u	u	ç	ç	æ	æ	
o	z	m	m	g	g'	q	a	a
n	n	y	y	u	u'	u	o	a
o	η	θ	θ	u	u'	u	o	u
n	η	θ	θ	h	h'	h	h	h
t	t	z	z	o	o	o	o	z
h	l	h	σ	σ	h	h	u	u
r	r	p	p	y	y	u	u	u
u	u	s	f	o	o	o	o	o
r	r	z	z	o	o	o	o	o

1-2

¹ Form employed by the International Phonetic Association.

appearance. In addition, the question of devising easily written and easily read script forms has to be thought of.

Professor Jespersen, of Copenhagen University, has invented what he calls an "Analphabetic Alphabet," by means of which he can represent any speech-sound by means of something similar to chemical or algebraical formulæ; but it would not be easy to read a book printed in this alphabet, and the writing of it would take many times

as long as the writing of any ordinary form of letters.

Difficulties. It seems quite evident that any attempt at graphic representation of *every* human speech-sound must be abandoned, and that we must rest content with the possibility of writing or printing the main types—some five score in number. Secondly, national prejudice in favour of already existing definite values of existing symbols should be, as far as is possible, respected. Thirdly, any form of alphabet adopted should be easily printed by any well-equipped printing house without the necessity of cutting many new types; it should be easily written, and easily read, whether in its printed or written form. The reduction of the number of sounds to the typical hundred will be found no bar to practical utility, and the reduced number will certainly be more generally acceptable to the average person than an overwhelming number of symbols. National prejudices may be overcome by careful investigation into the values attached to the symbols, and by assigning to each of them that which it has in the majority of the most important languages.

Choice of Symbols. As regards the choice of alphabet on which the international one should be based, there is little reasonable doubt that it should fall on the Roman, since comparatively few users of the Roman ever learn any others, and educated native users of others very frequently learn the Roman. The usual Roman alphabet contains twenty-six letters and, as there are capitals and smalls, there are fifty-two symbols. To the former might be assigned slightly different values from those of the smalls; but readers would object to seeing a capital letter in the middle of a word, and it would probably be more shocking to their sense of habit than even the insertion of some utterly new sign. Still, use will have to be made of some capitals, but they must be of such size that they will not seem out of keeping with the main body of the printed page. When appearing in the body of a word, use capitals *qua* capitals. There is no reason why the use of capital *initials*, from one point of view of an international alphabet, may not be entirely abandoned. Again, many types may be "turned" (inverted) without disfiguring the printed page, thus providing us with additional symbols. Many founts of

type contain two forms of the same letter: for example, s and ʃ. With these means at our disposal, the cutting of some dozen new forms of letters and the use of a few diacritical signs, it is possible to represent the hundred speech-sounds referred to above, and at the same time always to indicate the same sound by the same letter.

Principles of Formation. It is useful to begin with the vowels. In the languages of the world are found twelve typical vowel-sounds, the articulatory

SUGGESTED INTERNATIONAL ALPHABET.

	<i>Bi-labial.</i>	<i>Labio-dental.</i>	<i>Dental.</i>	<i>Retro-flex.</i>	<i>Palatal.</i>	<i>Velar.</i>	<i>Uvular.</i>	<i>Glottal.</i>
CONSONANTS	PLOSIVE . . .	p b		t d	ʈ ɖ	k ɡ	q ɢ	
	NASAL . . .	m	ɱ	n	ɳ	ŋ	ɴ	
	LATERAL . . .			l ɭ	ɻ	(ɻ)		
	ROLLED . . .			ɽ	ɽ̣		ʀ ʁ	
	FRICATIVE . . .	f v ɸ ɶ ʍ w ɥ (σ) (ρ)		θ ð s z σ ρ ʃ ʒ ʒ̣	ç j (ɥ)	(ɰ w) x ɣ	ʁ ʕ	h ɦ ɦ ʁ
VOWELS	CLOSE . . .	(y ɥ: ʉ u u:) (ɣ ʊ)			<i>Front.</i> i: i y: y ɪ ʏ	<i>Mixed.</i> ɨ: ɨ ʉ: ʉ ə: ə	<i>Back.</i> ɯ ɮ u u: ʊ	
	HALF-CLOSE . . .	(ø ö o)			e ø	ë ö ə: ə	o	
	HALF-OPEN . . .	(ɔ ɔ̃ œ)			ɛ œ æ	ɛ̃ ɔ̃ ɔ̃ ɐ	ɔ̃	
	OPEN . . .				a	ɑ ɒ ɔ:		

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positions of which have been scientifically ascertained. They are most of them to be found, more or less identical, in five of the best known European languages. In the columns below are given the suggested international symbols and words in the five languages in which the vowel may be found. Those of the French column may be taken as "cardinal, or those by which all other vowels may be measured or to which they may be compared.

	<i>French.</i>	<i>German.</i>	<i>Italian.</i>	<i>Spanish.</i>	<i>English.</i>
1. i	fils	Gebiet	figlio	hijo	feel ¹
2. e	été	See	meno	pero	get ¹
3. e	père	denn	prudente	—	—
4. a	patte	—	—	campo	cat ²
5. a	bas	Vater	quanto	—	father
6. o	note	Sonne	cosa	—	shot ³
7. o	beau	Sohn	mondo	hijo	mould
8. u	fou	du	tu	tu	too
9. y	pu	Füsse	—	—	—
10. ø	peu	Söhne	—	—	—
11. œ	peur	Töchter	—	—	—
12. ʉ	—	—	—	—	people ⁴

¹ The English sounds are not identical with the cardinal.

² As pronounced in the North of England.

³ The English sound is by no means identical with cardinal o.

⁴ This vowel ʉ is heard as a speech defect in English, replacing i. It is regular in Russian, and is the final vowel of the word АОНАЖАБІ.

It occurs also in Scotch, Gaelic, Gujarati, and many Oriental languages.

There are, of course, in language many more vowels than the twelve given above, but in an international alphabet it is not necessary to recognize more than fourteen or fifteen intermediate ones. Thus the short i of English *sit* or of German *bitte* lies between i and e; this may be represented by a small capital i in print and by an undotted i in

writing. Between e and a is found the vowel of the Southern English pronunciation of *cat*, for which the sign æ may be used, and so on. A few words may now be said about consonants. Here, again, we find many more varieties than are provided for by the ordinary alphabet; but, with very little difficulty, an international basis can be arrived at. Most of them have, broadly speaking, very approximately the same values in all languages. Such are b, d, f, g (as in *gay*), h, k, l, m, n, p, s, t, z. Others, such as c, j, r, q, v, w, x vary considerably in phonetic value, not only between language and language, but also in some particular language, or they are superfluous: *cox*, for example, could be spelled *koks*; and *quire*, *kwire*. Some of these, as in the case of the vowels, may be used with the value that is found to be most general internationally. Thus j could represent the sound of y in *yes*, and v would have the value it possesses in English and French. Others could be used to represent sounds not already provided for by a single symbol in the Roman alphabet. For the palatal sound, intermediate between k and t, which is heard in Hungarian, c would do. For many other sounds, inverted letters could be used, as in the case of o mentioned above. Small capitals might be used to show varieties of sound represented nominally by the same letter: R would admirably indicate the German "guttural" (really velar) r, the "Northumbrian burr." New types would have to be cut for some sounds—p for the French and Italian gn, the Portuguese nh, ɳ for the English and German ng. The already existing f should be used for the sh of ship, and a parallel use might be made of the long ʒ for the s of *vision*. Double sounds represented ordinarily by a single letter ought to be written with two. For example, the j of *judge* means a somewhat close union of d and z; German

z has the value of *ts*. Fables are given of the printed and script symbols (mainly those approved by the International Phonetic Association) on which may be based an International Alphabet fulfilling most of the requirements mentioned at the beginning of this article.

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ALPHABETIC METHOD, THE.—This system of teaching reading deals with letters before words, and is entirely synthetical. (See A B C METHOD.)

ALSTED, JOHANN HEINRICH (1588–1638).—The son of a pastor of the German Reformed Church, who was educated at Herborn, in Nassau, where, in 1608, he was appointed headmaster of the university and, in 1610, professor of philosophy. In 1619 he became professor of theology at Herborn and, in 1629, at the new university of Weisenburg, in Transylvania. He wrote a large number of works on philosophy and theology, and his *Encyclopaedia Philosophica* contains a general summary of the knowledge of the age. He also wrote an *Encyclopaedia Biblica*, in which he assumed that the sacred writings contained the first principles of all science and art.

ALTERNATING SYSTEM.—A means employed in class organization, in which the teacher divides his class into groups, which are instructed alternately. While he instructs one group, the other is engaged in private study or exercises.

ALTERNATION OF STUDIES.—The arrangement of lessons in such an order that continuous mental strain is avoided; recreative lessons, such as music and drawing, alternating with arithmetic, geography and grammar.

ALTHORP LIBRARY, THE.—(See RYLANDS LIBRARY, THE JOHN.)

ALTHORP, VISCOUNT (1782–1845).—A descendant of John, Duke of Marlborough, who became the third Earl Spencer. He was a strong Whig and had considerable sympathies with social reform. In 1827, he was made chairman of a committee appointed to consider national finance, and he was Chancellor of the Exchequer in Earl Grey's government of 1830 and Viscount Melbourne's government of 1834, and thus played an active part in the disturbed period when the new parliamentary franchise came into force and the poor laws were reformed. Althorp inspired great confidence in the country as well as in Parliament as an honest and prudent statesman, though his budgets of 1831, 1832 and 1833 were not party successes. His budget of 1833 is famous in the history of English education, since it included the first State grant in respect of Elementary Education. On Saturday, 17th August, 1833, a vote of £20,000 for the purpose of building schools, where there already existed the means of carrying on such schools, was passed after a strenuous struggle, in which T. B. Macaulay took part in favour of the grant, by fifty votes to twenty-six votes. In the debate, Lord John Russell showed that the Report of the Education Committee of 1818 had proved the need for such a grant. William Cobbett opposed the grant which appears in the Revenue Act, 1833 (3 & 4 Will. IV, c. 96, s. 17) as a grant

for the erection of school houses in Great Britain. Earlier in the same year Lord Althorp had helped Lord Ashley (famous in the history of philanthropy as the Earl of Shaftesbury) to pass the first General Factory Act (3 & 4 Will. IV, c. 103) for the protection, and securing the education, of child workers. The Bill was strongly opposed by the manufacturers of the north, and these Lord Althorp endeavoured to placate, but the House of Commons took a determined line in favour of the child workers, and the only question was the actual limitation of the hours of labour. It was finally decided that no child under 9 could be employed in a factory, that children under 13 could not work for more than eight hours, that no young person under 18 years should work for more than sixty-nine hours a week, while the idea of the half-time system was introduced. The Act (known as Lord Althorp's Act) attempted to provide inspected schools for work-children and made attendance a compulsory condition of permission to go to work. Lord Althorp was faced with many difficulties and much opposition in his efforts to secure a sound basis for social reform, but he is entitled to the credit of a policy which looked forward to social amelioration by means of limited hours of labour and universal education, the policy which, in the Education Act, 1918, has become the basis of national reconstruction and the inevitable line of advance.

J. E. G. DE. M.

ALTON, CRIPPLES' HOSPITAL AT.—(SEE CRIPPLED CHILDREN.)

ALTRUISM and EGOISM.—The basis of the science of ethics is the ultimate value of human actions in relation to the individual and to the society in which he exists. Hobbes (1650) propounded the view that man's first instinct is self-preservation and his first duty is to himself. For upwards of a century this view prevailed, until Jeremy Bentham, in the early years of the nineteenth century, took the opposite view that our acts should be aimed at securing universal happiness, and that by promoting the happiness of all, the individual would secure his own highest happiness. The eighteenth century, following Hobbes, was a time of individualism; Adam Smith and Bentham, opposing Hobbes, advocated collectivism, and the nineteenth century saw a great reaction against individualism. The opposing theories gave rise to the terms Altruism and Egoism. The supporters of altruism argue that society is necessary for man, who is a social being, and that man should be actuated by regard for others. Pure altruism as propounded by Comte (1830–1840) (*qv.*) means living entirely for others. Pure egoism says: "Live for yourself only." The great question that writers set themselves to answer is: "Why, and how far, should I concern myself about evil to others when the sympathetic pain to myself is not such as to outweigh the loss of pleasure involved in submitting to the restraint" (Professo Sidgwick in *Lectures on Spencer's Ethics*).

In Herbert Spencer's *Principles of Ethics* (Chaps. XI–XIV), egoism and altruism are discussed, and the two extreme views rejected. The writer considers that both pure egoism and pure altruism are impossible, and that there must be a compromise between the two extremes. "General happiness is achieved mainly through the adequate

pursuit of their own happiness by individuals; while, reciprocally, the happinesses of the individuals are to be achieved in part by the pursuit of general happiness. . . . The individual who improves himself is improving society; he who neglects himself, injures society." All writers agree that it is useless to expect either universal egoism or universal altruism; and Spencer argues that altruism may defeat its own ends by generating "unscrupulous egoism" in others. The selfish will prey on the unselfish and be encouraged by the success of their selfishness. It is commonly agreed that the general happiness of all is the ultimate end of human conduct, and both the altruists and the egoists maintain the superiority of their own systems as means to that end. Spencer does not hold that general happiness should be the immediate end of all our actions, and the altruists Mill and Bentham did not advocate self-sacrifice without limit. Even Comte did not expect all men to "live for others" in all circumstances.

It is the social duty of every individual to have a prudent regard for his own interests, and altruism would lead men to this self-regard as members of a society. Every man is altruistic or egoistic, but between the extremes there lie an infinite number of degrees. The egoist may find his own happiness in the performance of social acts; while the altruist may prefer that the same acts should not be the acts of the individual, but of the society for its members.

ALUNUS (see **ALMA MATER**).—The foster-child of the foster-mother. As *Alma Mater* describes the university in its relation to its students, *Alumnus* describes the student in his relation to the university. The name is much used in America, where the "Alumni" Association corresponds to "Old Boys'" clubs and associations in this country.

AMBIDEXTERITY (*ambo*, both; *dexter*, the right hand)—The power to use both hands with equal ease. This power is possessed by the monkey and the cat in the use of their paws, and among animals the question of being "right-handed" or "left-handed" never arises. In modern civilized countries it has long been considered proper to use only the right hand in writing and drawing, etc., so the left hand and arm have been largely neglected. The usefulness of being ambidextrous needs no demonstration. Many modern writers in discussing the teaching of free-arm drawing have advocated the training from the first, of both arms, and others advocate the same training for the fingers and wrists in writing. Learning to write is only a question of gaining control over certain muscles, so as to secure a proper sequence of muscular movements; and there should be no more difficulty in training the left hand than the right, if the task be entered upon in early life.

AMBROSE, ST.—Born about A.D. 340, probably near Tours, in Gaul, he was educated at Rome and, after practising law at Milan, was appointed Consular Prefect of Liguria, which included Milan. At the urgent call of the Milanese, he entered the Church and became Archbishop of Milan eight days after his baptism. As archbishop, he showed great energy, giving all his property to the Church for the benefit of the poor, and gaining great fame for his bold attack on the Emperor Theodosius, who had ordered a general massacre in Thessalonica

as a revenge for the death of some Roman officers in a city riot. Ambrose refused to admit the emperor to the cathedral until he had done penance.

He introduced into the church at Milan the regular practice of antiphonal hymns, and Ambrosial chants remained in use in Milan until Gregorian chants were introduced in the sixteenth century.

AMBULANCE WORK.—(See **FIRST AID**.)

AMERICAN COLLEGES AND UNIVERSITIES.—(See **UNITED STATES**.)

AMERICAN EDUCATION SOCIETY.—This society, founded in 1815 for the education of young men for the Protestant ministry, was devoted solely to religious education, and assisted students by paying their expenses in schools and colleges.

AMERICAN INSTITUTE OF INSTRUCTION.—Founded in 1830 for the spread of knowledge in regard to education, this institute holds annual meetings of several days' duration, usually at Boston. At the meetings, papers are read and discussions held on matters of prominent educational interest. The proceedings are published, and include contributions from the chief American educational leaders and other public men.

AMERICAN LYCEUM ASSOCIATION.—Formed in 1831, this association held meetings annually till 1839. Its objects were to promote the improvement of American schools and teachers by legislation, improved methods, new subjects of study, and good text-books and apparatus. These and kindred subjects were discussed at the annual meetings, and the work of the Association was beneficial in promoting the training of efficient teachers and in securing uniformity of teaching in the schools of the United States.

AMNESIA.—Loss of memory, inability to recollect, a symptom of various forms of mental disease, and one of the indications of senile decay. Amnesia may result from a shock and cause the sufferer to forget everything which preceded the shock, and may be so general that the individual is obliged to learn over again all that he knew before. In the aged, there is frequently a loss of memory in regard to current or recent events, accompanied by a vivid remembrance of events in early life. Amnesia may be complete or incomplete, temporary or continuous. Cases occur in which the individual loses his own identity, and is unable to recall even his own name or to recognize the faces of his best known friends.

AMSTERDAM UNIVERSITIES.—(See **HOLLAND, THE UNIVERSITIES OF**.)

AMUSIA (a form of aphasia).—Inability to understand music as a mode of expressing thought or feeling.

ANAEMIA.—(See **AILMENTS AND INFECTIOUS DISEASES IN SCHOOL LIFE**.)

ANALGESIA.—A disorder of the nervous system, resulting from disease of, or injury to, the spinal cord, and rendering the sufferer incapable of feeling pain. Paralysis is an extreme temporary cramp—a mild form of analgesia.

ANALOGY.—The term has been used in the following senses: (1) Sameness of *quantitative* relationship, or proportion (*e.g.*, 1:2::3:6); (2) sameness or similarity of *qualitative* relationship (*e.g.*, "as the heavens are higher than the earth, so are My ways higher than your ways, and My thoughts than your thoughts"); (3) similarity of almost any kind, short of the similarity between members of the same recognized species in respect of some feature characteristic of that species (*e.g.*, the wings of insects are analogous to the wings of birds). The first two meanings correspond to those of the Greek original *ἀναλογία*. The third meaning corresponds rather to that of the Aristotelian *παράδειγμα* ("example").

The logical interest of analogy arises from its use as a basis of inference. All inference is based upon similarity, real or alleged; and the validity of an inference from one case to another depends upon, and varies with, the degree of pertinent similarity between them. Accordingly, inference from analogy will possess varying degrees of justification according to the nature of the similarity in which the analogy consists. From analogies of the first of the above three kinds, perfectly correct and exact results are obtained so long as we make no slip in the elementary arithmetical or algebraic processes involved in the solution of problems in proportion—*e.g.*, given that 1 cub. ft. of water weighs 1,000 oz., we infer by analogy that the water contained in a full tank measuring 4 ft. × 2 ft. × 3 ft. must weigh 24,000 oz., because 24,000:24 (the capacity of the tank)::1,000:1. But it is very different when we pass to the other, non-quantitative kinds of analogy. Inferences from qualitative analogies cannot, as such, be depended upon. The principal use of qualitative analogies consists in suggesting lines of inquiry in which more satisfactory scientific methods can be employed. In other words, their service consists in originating hypotheses, and thereby guiding observation and experiment in accordance with the inductive methods. So long as an inference rests solely upon (qualitative) analogy, it can only be regarded as a tentative suggestion—no more. It may be true, but it has not yet been shown to be true. So far as scientifically established truth is concerned, analogy may point out the road along which the toiler may work his way towards the goal; it does not mark the attainment of the goal. The reason is this: Generally speaking, what happens in inference from (qualitative) analogy is that a certain object (or class of objects), say *S*, is seen to resemble some other object (or class of objects), say *Z*, in respect of some character, say *M*; and from this similarity it is surmised that *S* resembles *Z* in respect also of some other attribute, say *P*, which *Z* is, while *S* is not yet, known to possess. Now, an inference of this sort would be adequately justified only if it could be shown that *M* and *P* are, directly or indirectly, connected by some fact of causation, or by some other uniform conjunction. Indeed, it is only in so far as there is some ground for supposing *M* and *P* to be thus connected that the similarity in respect of *M* is relevant at all as regards similarity in respect of *P*—some resemblances being obviously superficial and irrelevant. Now, if *M* and *P* really are connected, their connection can only be established by induction; and, in that case, the validity of the inference will rest, not on the analogy, but on the inductive methods. On the other hand, if the application of

the inductive methods is not practicable, then the analogical inference remains a bare surmise, which may, indeed, be true, but has not yet been corroborated by the kind of evidence which science requires. Hence, in the more advanced sciences, analogy plays a relatively small rôle—the scientific results are supported by scientific evidence; while the analogies, by which those results may have been first suggested, are of interest chiefly as events in the mental history of men of science. In the less advanced sciences, on the other hand, analogy plays a much more striking rôle. For in the earlier stages in the history of a science, the investigator's chief means are the classificatory and comparative methods, and he is peculiarly dependent upon helpful analogies. This may explain why, *e.g.*, in the comparatively young science of sociology the biological analogy looms so large. The more difficult the task of unravelling the simple laws or uniformities exemplified in the complex phenomena under investigation, the more does one feel the need of the guidance of analogy. This, in any case, is the proper function of analogy—it is neither induction, nor a substitute for induction, only an auxiliary to it. But, as an auxiliary to inductive investigations, the value of analogy is very high, and one may well claim for it the distinction of having helped to bring to birth many of the most precious fruits of scientific labour. A few brief examples must suffice. The analogy between the motion of the moon and the movement of a falling body first suggested to Newton that the moon may be influenced by a centripetal force towards the earth, as he subsequently proved to be the case. Our present conception of the solar system was first suggested by the analogy of the miniature stellar system of Jupiter and the four Medicean satellites which revolve round him. The movement of the waves on the face of the water led, by analogy, to the undulatory theory of sound, and this, in turn, originated the analogical undulatory theory of light. Many of the most fruitful discoveries in modern mathematics are due to the analogy between algebra and geometry, which was first discovered by Descartes. Lastly, let me refer to the theory of Natural Selection. Darwin (*q.v.*) modelled this theory on the analogy of artificial selection by which the existing varieties of domestic animals have been produced by mankind—the struggle for existence being conceived as exercising the function of selection, which, in the case of artificial selection, is exercised by man. A. WOLF.

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ANALOGY, THE PSYCHOLOGY OF.—Analogy plays a part in all experience. Nothing is exactly the same as anything which occurred previously. When I see my father for the thousandth time, he is not exactly the same father. He is only *analogous* to the person seen before. Where the analogy is great, recognition is swift and automatic; but where the fact or situation presented is complicated and different from any previous experience, definite efforts must be made to resuscitate various portions of the past to thoroughly grasp the "new." Where the analogies between the "new" and the "old" are less easily discoverable, we become conscious that the present is analogous to the past, and can be apprehended only on the basis of this similarity.

It is thus in the search for more obscure analogies

that we come to speak of analogy at all. This implies that a great advance has been made in the field of abstraction. The individual possesses elementary abstract notions (e.g., *white, black, equal, unequal*), and has grasped *general truths* which apply to an indefinite number of concrete cases (e.g., *heat causes expansion*). He is not, however, satisfied that he understands a given concrete situation until he can see and state clearly the points of likeness between this case and others previously apprehended. This involves a grasp of the general truth common to two or more cases.

In such efforts "to see the one in the many," one can often guide another by the aid of language in the resuscitation of analogous experiences which the latter would not otherwise recall. Teachers constantly perform this function, but they must not aid the scholar's struggling mind too frequently or too readily. Whether "association by similarity" takes place in the pupil's or teacher's mind, the general principles are the same. The teacher's richer experience renders him more capable than the pupil whom he is frequently justified in guiding. Teachers may explain to children the effect of the slope of the land on the direction of rivers by reference to the analogous case of rain falling on a gabled roof, or illustrate one function of food by likening it to the coal supplied to a steam-engine. Such may be called *teaching by analogy*, though usually, in pedagogical circles, it is styled *the use of illustration*.

B. D.

ANALYSIS OF SENTENCES.—Grammar has, in recent years, lost its place as one of the most important of school subjects, and parsing and analysis have fallen into disrepute. The newer methods of teaching foreign languages are responsible in some measure for this disregard of the study of formal grammar, but doubtless the chief cause has been the growing recognition of the importance of English as a school subject. It is rightly felt that school should give the child opportunities of becoming acquainted with English literature, and enable him to master his mother-tongue. Analysis of sentences, though not without value, is obviously not an effective means of attaining these ends; and the study of the science of language has disappeared from many schools in favour of the study of languages and literature. Nevertheless, there remains a place for the science of grammar. It should come towards the end of the school course, at the age of 13, in elementary schools, and rather later in secondary schools.

The study of language as distinguished from the study of a language begins when the attention is directed to the form in which thought is universally expressed by means of language, that is, to the sentence. The method of the science is necessarily analytical. A sentence is some one's thought about an event, regarded as an objective situation in which another mind is also interested: a thought expressed in a way that may enable that other mind to attain a similar thought. From its very nature, it consists of a part denoting the thing about which a happening is affirmed or suggested (that is, *predicated*), and a part which denotes the event or happening, and makes the predication. In every sentence, the part denoting the thing (the Subject) may be distinguished from the part making the predication (the Predicate). Practice in making this distinction can be given in class, and the exercise can be done orally. The time occupied by

written analysis of sentences in tabular form is out of all proportion to the utility of the exercise. When the function of Subject and Predicate is clearly grasped, the detailed examination of particular sentences on the traditional lines may be undertaken: the Subject being analysed into Name proper and Adjectival adjuncts, the Predicate into Verb (with its Complement or Object) and Adverbial adjuncts, the whole of the work being done orally. The examination of instances will bring out the fact that the most important distinction in grammar, after the fundamental distinction between Subject and Predicate, is that between the Transitive and the Intransitive Verb, for the form that the Predicate of any sentence assumes is determined by the nature of the action predicated.

Grammar studied on these lines need occupy a very small part of the school time-table—half-an-hour a week for one school year; but in the hands of a teacher who has grasped the subject he professes, it will prove to be a study stimulative both to thought and imagination.

L. B.

ANALYSIS.—(See ENGLISH GRAMMAR, THE TEACHING OF.)

ANALYTIC PSYCHOLOGY.—(See PSYCHOLOGY, THE RELATIONS OF ANALYTIC AND GENETIC TO GENERAL.)

ANALYTICAL GEOMETRY, THE TEACHING OF.—(See GEOMETRY, THE TEACHING OF CARTESIAN.)

ANÆTHRIA.—Absence of, or loss of, or defect of, the power to articulate. This is frequently met with in early life, and young children are often slow to acquire the muscular control necessary to produce articulate speech sounds. It occurs also in old people, as the result of nervous disease and senile decay.

ANCIENT BUILDINGS, THE SOCIETY FOR THE PROTECTION OF.—A return made in March, 1876, to the House of Commons recorded that £25,000,000 had been expended in the years 1840 to 1873 on the "terrible devastation" (as the Society puts it) of over seven thousand cathedrals and parish churches in England and Wales, which "were finally robbed of great part of their historical and aesthetic value, and passed from the rank of national monuments to become simply churches." John Ruskin, in his *Seven Lamps of Architecture* (1849), speaking of the influence of ancient art upon modern, gave a solemn warning to architects and the public of the effect of the alterations then being made. In 1877, William Morris gathered a meeting of archaeologists, painters and architects at Queen Square, London; and the ten persons present decided to form an association to be called the Society for the Protection of Ancient Buildings.

An appeal was at once issued for the "abandonment of restoration as an impossible ideal, and for the adoption of a more conservative and rational system." The appeal met with little success; but it was followed up by articles in newspapers and magazines; papers were read before the Royal Institute of British Architects and the Social Science Congress; and the daily Press, in general, gave sympathetic support to the Society's efforts. At the end of a year the Society was supported by such well-known men as Thomas Carlyle, W. Holman



Rothamsted Agricultural Laboratory, Harpenden



The Sample Room at Rothamsted Agricultural Laboratory

Hunt, Sir John Lubbock, John Ruskin, G.F. Watts, and the Rev. Mark Pattison. The Society in its first manifesto specified the features in a building that made it worth protecting as "anything which can be looked upon as artistic, picturesque, historical, or substantial; any work, in short, over which educated artistic people would think it worth while to agree at all." It therefore pleaded with all those who had to deal with such buildings "to put Protection in the place of Restoration," and to resist all attempts to tamper with the fabric or the ornament as it stands. The Society would have our ancient buildings treated as monuments of a bygone art, created by bygone manners, which modern art could not meddle with without destroying. The records of the Society supply a vast number of examples of ignorant destruction of ancient parts of buildings to give way to modern work. The Society advocates the preservation of the ancient surface and appearance of ancient buildings, and has done much in giving advice and assistance in carrying out work from the inside which leaves the external face untouched (e.g., the restoration of Lake House, an Elizabethan mansion, near Amesbury; Forthampton Manor House, near Tewkesbury; and Knoyle Church Tower, in Wiltshire).

The preservation of ancient monuments has received the attention of Parliament in recent years, and the Ancient Monuments Consolidation and Amendment Act (1913) was of great value to the cause.

The Society is formed of life members who subscribe ten guineas, and subscribers who pay at least half a guinea annually. The Annual Report issued to members every summer gives a full list of the cases which have come before the Society during the year, with detailed descriptions of some of the most interesting. Frequently, photographs of the building both before and after alteration are given to illustrate the Society's approval of, or its objection to, the alterations. Among recent cases of objection are the repairs of Chester Cathedral Old Porch, the Guildhall at Lavenham, and the Bridge at Lyme Regis.

The Secretary's address is 20 Buckingham Street, Adelphi, London, W C 2

ANDREA, JOHN VALENTINE.—(See UTOPIAS, EDUCATIONAL)

ANGEL, MOSES.—(See JEWISH ELEMENTARY SCHOOLS AND JEWISH EDUCATION.)

ANGLO-NORMAN DIALECT.—After the establishment of Norman rule in England, Norman-French became the language of Court and Government. Legal and official documents were all written in Latin or Norman-French; and when education was controlled by the Conqueror, the Norman-French language was used in all the monastery schools. Some of the effects of its introduction were the modification of old inflections; the bringing into disuse of many English words, especially in poetry; and the introduction of a large number of French words into the English language. A dialect known as Anglo-Norman resulted from these changes, and the next three centuries after the Conquest saw the rise of a number of sub-dialects preserved in remains of the literature of the period. "A strange jumble of words and idioms, Old English, Scandinavian,

and French goes to form the New English" (Oliphant). In the middle of the fourteenth century steps were taken to end the use of Norman-French in the schools; and, in 1362, Edward III enacted that English should be the language employed in courts of law.

ANGLO-NORMAN IN ENGLAND, THE USE OF.

—The Norman Conquest completed the introduction of a tongue that had a peculiar and interesting vogue in England, a tongue that still is used for certain official purposes. The Anglo-Norman or Anglo-French tongue became for centuries the tongue of the grammar schools, the universities, and the law courts; and even to-day a considerable percentage of law words are Anglo-Norman, while the King's assent to, or dissent from, Bills that have passed through Parliament is expressed in this tongue: *Le Roi le veut* or *Le Roi s'aviserà*. The language itself, though in England it broke into several dialects and a considerable and interesting literature survives, never became really popular; but a knowledge of it is essential to those who have to study law reports down to the end of the sixteenth century, or who wish to understand the merits of the early school books. Anglo-Norman was the sole language in the grammar schools from soon after the Conquest until after the Black Death of 1349. Higden, in his *Polychronicon*, written about 1327, tells us that the children in the schools were at that date compelled to construe their lessons in French, "and so they haveth seth the Normans came first in to Engeland." The policy was like that adopted by Henry VIII in Ireland, and in more recent times by various dominant powers in Europe. Erse was nearly stamped out in Ireland by this means, but the attempt to destroy English entirely failed. Trevisa, in his edition of the *Polychronicon* (1385), tells us that after the Black Death, John Cornwaile, a master of grammar, changed the practice at Penricch School, and this precedent was followed so universally, that, in 1485, "in alle the gramere scoles of Engeland, children leveh Frensche and construeth and learneth in Engliche . . . Also gentil men haveth now moche i-left for to teche here children Frensche."

Anglo-Norman School Books. But for three centuries it was the school-tongue, and it is of interest to note three school books in particular that were largely used in England and were in Anglo-Norman. The first, entitled *de Utensilibus*, was from the pen of Alexander Neckam, who must not be confused with another school grammarian, Alexander a Villa Dei, who produced the *Doctrinale Puerorum* about 1209. The *de Utensilibus* is a little earlier. Neckam died in 1217. His book is a school-book or vocabulary in Latin, with a gloss in Anglo-Norman, in which English words occasionally occur. About fifty years later we have a short vocabulary of the names of plants, in which the explanations of the Latin names were given both in Anglo-Norman and English. Thus we see English slowly creeping into the schools. The third book was written at the end of the thirteenth century by Walter de Bibbescombe at the wish of the Lady Dionysia de Monchensy of Swanscombe in Kent. It was written in Anglo-Norman, with an interlinear gloss in Latin. The object of the book was to teach the tongue to children of gentle birth. A statute of the University of Oxford of uncertain date directs that boys shall be taught to construe

in French as well as English, in order that the former tongue may not be forgotten. Mr. H. Anstey (*Munimenta Academica Oxon.*, pp. lxx and 438) attributes this statute to the thirteenth century, but the extrinsic evidence of Trevisa's *Polychronicon* makes it almost certain that it is a fourteenth century statute. Certainly the tongue was used in the schools and in the castles until the Black Death of 1349. The texts of the vocabularies mentioned above are to be found in Mayer's *Library of National Antiquities*, edited by Thomas Wright in 1857.

J. E. G. DE M.

ANGLO-SAXON SCHOOLS.—The end of the Roman occupation of Britain left a certain number of schools in existence. The grammar school was a universal element of town life throughout the Empire, and towns such as York, London, Gloucester, Lincoln, Verulam, Viroconium, and Segontium undoubtedly had schools (*Christianity in Early Britain*, by Hugh Williams, 1912, p. 181). The Roman methods of education, the terminology, and the grading of schools survived, and has lasted unto the present day. The coming of the Angles meant a revival of what was a Roman Imperial system of education, with the grafting into it of new elements. Latin remained the tongue of learning even in the great monastic schools founded in Western Britain by the disciples of Illtud and Dubricius. The continuity of the Roman Imperial and the Anglo-Saxon schools is shown by Bede (*Hist. Eccles.*, iii, 18), who tells us that in A.D. 630, Sigbert, king of the East Angles, imitating the Gallic schools and assisted by Bishop Felix of Kent, founded a school "with masters and teachers after the manner of the people of Kent." Thus Kentish schools were certainly of Roman origin. But it is noticeable that Sigbert also invited Fursa, the Irish saint and missionary, into East Anglia: so that we may say that the earliest of the Anglo-Saxon schools represented the Irish, the Gallic, and the Roman educational traditions. The school or schools are mentioned by William of Malmesbury (*Gesta Pontificum Anglorum*, Rolls Ed. p. 147), who says that schools for the teaching of letters were founded in suitable places by Felix, who died at Dunwich in 646. Dunwich very probably was the site of the first school (if there were more than one). The suggestion that this school was at Cambridge, and was the origin of the university (*Grantebrig schola a Sigberto Rege*), is a seventeenth-century fiction. Felixstowe in Suffolk, and Felixskirk in Yorkshire, preserve the name of the first founder of Anglo-Saxon schools. Felix himself was a Burgundian. Half a century after the death of Felix, Augustine, the first Archbishop of Canterbury, came to England as the envoy of Pope Gregory the Great, and the Roman papal grew, with the advent in 668 of Archbishop Theodore of Tarsus and the Abbot Addian. A great school of learning arose. Aldhelm and John of Beverley, who was the teacher of Bede, were educated at the Canterbury school. Bede tells us (*Hist. Eccles.* iv, ii) that in 732 there were English scholars who knew Latin and Greek as well as their native tongue. Bede, indeed, calls Latin the vernacular, and he himself wrote treatises on the Seven Liberal Arts for use in schools. A little later, the centre of European learning shifted from Canterbury to York, and Alcuin (735–800), who carried English humanism into the Empire of Charlemagne, boasted of the learned men and noble libraries of England. Alcuin in 781 became the

master of Charlemagne's famous Palace School, and it may be said that to England in Anglo-Saxon times, Europe owed that basis of learning on which rose the system of universities and schools which, in the shape of Oxford and Cambridge, was to give to England the reward for the continental work of Alcuin. Alcuin produced school books that were based on the earlier work of Priscian and Donatus.

The Second Period of Anglo-Saxon Scholarship. With the coming of the Danes, the first period of Anglo-Saxon schools and scholarship died away. But there was a great revival under King Alfred. Towards the end of the ninth century, and in the early years of the tenth century, we find that the parochial system of education which had been introduced on the Continent under the influence of Charlemagne by Bishop Theodulf of Orleans (797) begins to appear (*Canon of King Ethelstan*, 926; *Canon* [51] of *Edgar*, 960). Theodulf's Canon, directing the creation of parochial schools, was promulgated in England by Aeltric, Archbishop of Canterbury, in 994 or 995 (Johnson's *Laws and Canons*, i, 450). Moreover, by this date we get the beginnings of the system of episcopal control of education which had been directed by Pope Eugenius in 826 (*Concilium Romanum*, Canon 34). The episcopal system of control was not in active operation till just after the end of the Anglo-Saxon period; but its source in England is Anglo-Saxon, though it was made effective by Norman ecclesiastics. Throughout the Anglo-Saxon period we see the growth and organization of ecclesiastical influence in education, and the slow laying of the foundation on which our mediaeval and subsequent systems of education were based. The main influences were Roman, Celtic, and Burgundian; but England certainly gave to the Continent payment in full measure for the help that she had received.

J. E. G. DE M.

ANGLO-SAXON SCHOOLS.—(See ENGLISH SCHOOLS TO EDWARD VI, HISTORY OF)

ANGLO-SAXON SCHOOLS.—(See MEDIAEVAL EDUCATION.)

ANGLO-VERNACULAR SCHOOLS.—(See INDIA, EDUCATION OF BOYS AND MEN IN.)

ANIMAL EDUCATION.—There are many theories of animal education, not including the prevalent notion that animals have no education. For convenience, we may reduce these theories to two extremes—the mechanical and the rational; then, for further convenience, we shall ignore theories altogether and, with open eyes, go straight to Nature to find out the facts. Even here, though facts are abundant, we may as well confess that we shall learn little of certainty regarding animal education. For a specific fact is an expression of some general principle, which we understand but imperfectly; and the fact that speaks one thing to a man may speak something quite different to the animal over yonder, on the other side of the gulf which separates humanity from the lower orders. The self-sacrifice of a mother animal for her young, the lifelong attachment of a hawk to his mate, the vixen's oversight of the play and hunting of her cubs—we call such matters love, loyalty, training; but we know not what the beast might call them, nor whether they seem to him to ennoble life or to harass it, nor how far the element of

conscious choice enters into his action. In a word, our knowledge of the animal mind is very largely a matter of inference. There is another preliminary consideration which troubles a man who would write soberly of animal education. While our natural history books all generalize about animals, their colours, classification, and such commonplaces, no sooner do you begin to study wild life intimately than you are confronted by some extraordinary individual action of bird or beast that runs counter to all generalizations. For example, on the desk before me is a specimen of the American woodcock (*Philohela minor*), and a photograph of the bird in the flesh is herewith submitted. The left leg has been broken just above the knee, and the bird—a mature female—has played surgeon to herself by placing a cast around the break. Under the microscope this cast resolves itself into vegetable fibres, fine feathers, and an adhesive mixture of clay which binds the whole firmly together. I have personally observed two such cases of surgery among the snipes, and have trustworthy records of several more; but whether such cases are typical or exceptional, and whether we should measure the snipe family by its geniuses, as we measure humanity by its Newtons and Lincolns—these are unsettled, and perhaps unanswerable, problems which lead to endless disputation. For the sake of harmony, therefore, we shall avoid all unusual examples in our attempt to answer the simple question: "What does the wild animal know, and how does he know it?"

It is important, also, to keep in mind this fundamental principle, so thoroughly neglected in our schools, that education is not putting something new into an infant, as if a head were but an empty box; it is rather, as the derivation of the word indicates, a leading forth of old powers which are born with the infant, but which remain dormant until the right influence awakens them to activity, as the seed's powers awaken at the call of April's sun and rain.

What an Animal knows. As for what the wild animal knows, that may be fairly accurately summarized, if we except the geniuses. He knows what food is good for him, and where to seek it; how to catch and kill his prey; how to escape his natural enemies; how to accommodate himself to cold or heat, to sunshine or tempest, to open or timbered country; how to woo his mate; how to build a secure nest or den; how to sustain and protect the young; how to find his way over long distances to a spot beyond the ken of sight or smell; how to guess at to-morrow's weather, as he shrewdly does, either by outward signs or by inner feeling; how to interpret the voice of his fellows, their food calls, assembly notes, danger signals, and to act in harmony with the summons or warning; how to judge from the appearance of an approaching animal whether he be friendly or hostile or indifferent; how to exercise his muscles by play; when and where to seek his daily rest or his yearly hibernaculum; how, when danger approaches, to form quick decision whether to rush away, or seek concealment, or lie still and let his soft colours hide him, as they certainly do hide him—a young animal especially—when he remains motionless in his natural environment. Even such a bare list is surprisingly large, and would be larger if other naturalists were to tabulate the things that birds and animals commonly know. One observer calls attention to the host of wild animals that know

when and how to store a winter's supply of food, and how to prevent grains or other provender from sprouting or spoiling in the granary; another instances the beaver's dam and transportation canals; a third, who has pondered with St. Augustine the mystery of time, notes that certain birds—the ospreys, for example—return year after year on approximately the same date to their nesting places; a fourth is impressed by the fact that birds know how to feign injury, and by floundering in front of an enemy to lure him away from nest or nestlings; a fifth points out the flock laws or regulations of the crow, the herd laws of the caribou, the pack laws of the wolf; a sixth exhibits the undeniable fact that many wild creatures know how to put two and two together, and make not three but four out of the combination. Some of the latter instances, however, may be exceptional; and the former list is, perhaps, more typical of the ordinary accomplishments of wild birds and beasts. Domestic animals, though they show very clearly the possibility of animal education, are too unnatural, and too dull in comparison



American Woodcock, showing broken leg encased in plaster made by the bird.

with their wild prototypes, to be included in the present discussion.

How an Animal knows. Comes now the question of how the animal knows or learns, and here we enter upon debatable ground, and must go softly. In general, we may say that an animal knows some things by instinct; that he learns others from his mother's training or example, and still others from his own investigation; and that some of his knowledge is undoubtedly due to a combination of the three other factors of instinct, training, and experience. To illustrate our general thesis: Most animals have a sure sense of direction, and this seems to be wholly a matter of instinct; but I have no space here to define the word or to explain the fact. As an example of knowledge gained by training, one might submit the fawn, which learns chiefly from his mother's action or danger signals what animals may be safely ignored, and what others must be avoided. (If you object that this is a matter of smell or of instinct, I answer that the fawn brought up by a wild doe runs away from you; while another fawn, brought up by the same doe after she has been tamed, will come fearlessly to eat from your hand.) Some of the devices of an old fox or "coon" in eluding the hounds may be cited as typical of the knowledge gained by experience; and as an illustration of the knowledge due to a combination of factors, the nest-building of

birds is conspicuous. That they build instinctively, after a fixed pattern evolved by the species, is probable; that old birds build better, more neatly, and more safely than the young, is evident to every candid observer. It is only after one has observed and pondered the process of animal training that one reaches the conclusion that all education is essentially the same; and that our best schools, our kindergartens especially, are founded upon instincts which Nature had developed in her animals before man appeared upon the scene. To be specific, all education, whether of man or beast, is based solidly upon the instinct of curiosity.

Curiosity and Imitation. That wild creatures are instinctively curious has often been pointed out, and may be tested by a simple experiment. Go out into the woods, sit down quietly there, and from your concealment send forth the twang of a jew's-harp, the repeated flash of a looking-glass, or any other innocent summons; and presently you shall see some inquisitive bird or squirrel or deer coming quickly, with bright eyes and alert ears, in your direction. Every new thing in the bush attracts attention; and, unless the thing be noisy or threatening, the curiosity of wild animals is far more conspicuous than their timidity. That this curiosity among the higher orders is not concerned with food (as might possibly be said of a goldfish, which approaches your finger laid against his glass globe), but is essentially a matter of knowledge, is evident from this repeated observation: that animals display the liveliest curiosity when they are roving the woods in that pleasant, idle hour after their hunger has been satisfied. Now, curiosity is simply the desire to know, to find out; and Nature has implanted it deeply in every creature. Without this natural curiosity, this instinct of knowledge, our schools were quite impossible. You might, by labour and sorrow, pack a few things into a boy's head; but you could never really educate him, that is, educe the powers of learning that are asleep within him. However complex it may appear, our modern education is but the germination and flower of a natural animal instinct. Associated with this fundamental instinct are, at least, two others which lead inevitably to some measure of animal education. The first is the instinct or impulse to follow and imitate a superior. The impulse is strong in young children, who naturally want to go where their elders are going, and who imitate their heroes in speech, in gesture, and especially in heroics. It is even stronger in young animals, as you may discover by observing how cubs or nestlings on their first outings follow eagerly after the mother, running where she runs, stopping where she stops, and taking quick alarm from her action in presence of an object which excites her fear, but of which the little ones are wholly ignorant. The higher you go in the scale of animal life, the more obvious does this imitative instinct become. In deer-mice, for example, the instinct is apparent only to the closest observation, while in young black-bear or grizzly cubs it is the most evident and fascinating of all their droll ways. On all journeyings a mother bear goes ahead invariably, and behind her the toddling cubs seem marvellously intent on following her every action. When she shuffles along unconcernedly, they scamper to keep up the pace; when she stops, they halt on the instant; when she noses an object, they all investigate it in turn; when she points her head steadily in one direction, they range alongside, lift themselves against her sides,

and peer intently under her neck or between her ears to discover the object of her attention. Occasionally she rises to her full height, rocks her great head up and down, swinging it from left to right and back again, sniffing keenly the while in order to catch any tainted atom from the air that may tell her what is afoot in the woods. And instantly the cubs, as if the mother's action releases a hidden spring within them, rise up unsteadily on their haunches, rock their pointed black noses up and down, swing their little heads with the ridiculous big ears left and right—all in exact imitation of the old bear, but without any idea at first of the cause or meaning of her action. So as they go their silent way through the wilderness, they learn the characteristic bear habit of sifting the air frequently to sort its manifold messages. Such instincts are, in themselves, tremendously significant; but they would be barren of fruitage had not Nature supplemented them by another, which compels every wild mother to share what she has with her dependent little ones—in a word, the instinct of teaching.

The Instinct to Teach. That mother animals, even when hungry, share food with their young is too well known to need illustration. That this is a natural impulse, stronger even than the instinct of self-preservation, is probable from the fact that a sorely-wounded mother animal will crawl home and give her cubs drink, and curl around them in protecting warmth as she dies. It is equally true, though you will not find it in any treatise on education, that wild mothers have the ineradicable instinct to share what they know, as well as what they have, with those who are dependent upon them. For note these facts, which will be plain to you when you shake the dust of museums from your eyes and look frankly on Nature: that a mother animal knows where food is, and conducts her young to it; that she knows how to hunt, and takes the young with her and leads them in the hunting; that whenever she knows where trap or enemy or danger lurks, she surely leads her cubs away from a peril of which they have as yet no knowledge or experience. Moreover, she holds the young to strict account, and is often observed to correct or punish them when they are heedless of her example. All this, and more in the way of training, a mother animal does every day. Whether her teaching be conscious or unconscious, purely instinctive or modified by intelligence, is entirely outside our present interest. We observe simply that every wild mother is a teacher, and a first-class teacher. That her training of the young results in a very practical education for the chief end of animal existence is only another revelation of Nature's endless variety in unity. She takes her ancient pattern of education, and in a thousand varieties of bird or beast makes the old plan as new and infinitely surprising as the dawn of another day.

One might bring forth other suggestive facts of animal life: that play is, in the jungle as in the kindergarten, a prevalent method of education; that you can teach any wild animal many things which his forebears never knew; that the collic and the wolf are brothers who have the same instincts precisely, their different actions in the presence of a flock of sheep being wholly due to their different training; and many other examples to the same effect, namely, that all animals have the ability to learn, and are, therefore, good subjects for education. And it would be impossible for such

animals to follow a wild mother during the formative months of their lives, and then to meet the varied experiences of wilderness life, without undergoing a definite and positive educational process.

I am speaking now of the higher orders of animals; creatures with brains and a physical organization like our own, whose actions we may judge, however imperfectly, by what little we know or think we know of our own psychology. Of the lower orders—the insects, fishes, reptiles—it is much harder to speak with even the shadow of certainty. Frankly, I do not know these distant creatures well enough to judge them; and I suspect that, notwithstanding the records of such observers as Lubbock and Fabre, nobody knows enough of the intimate life of insects to draw any positive conclusion as to their mental processes, or even to say whether they ever have a mental process. The young apparently receive no training from their mothers; their life seems at times dimly instinctive, at times mechanical, at times hopelessly stupid; and then, when you think you know all about them, they surprise you by an action which seems intelligent, and for which comparative psychology offers you only a theory that does not explain the fact.

To summarize our subject: all the higher orders have the ability to learn, and their native potentiality of education is developed by the three factors of instinct, maternal training, and experience. Their education is strictly limited by their needs, and the process can never go far, in comparison with our human education, because animals have no language and no written records. Yet the difference is of degree, not of kind; for whether you look with seeing eyes upon a mother bear with her cubs, or a mother robin with her nestlings, or a human mother with her children, you must discover the same natural principles of all education: on the one hand, the eager curiosity of youth, and the impulse to follow and imitate a superior; on the other, the Divine unselfishness of wisdom, as revealed in the instinct of mother animals to share what they know with their helpless offspring.

W. J. L.

ANIMAL LIFE, THE STUDY OF.—(See ZOOLOGY, THE TEACHING OF)

ANIMAL PSYCHOLOGY.—Animal Psychology is primarily concerned with the behaviour of animals: their ways of reacting or responding to given situations in which they find themselves or are placed; it is an endeavour to explain these forms of behaviour, that is, to trace them to their sources after grouping and classifying them. It assumes, for all animal as for all human behaviour, that there are among the springs of action some which may be called mental. What are the differences between the animal and the human mind, and between the minds of different species of animals? Is there an evolution of mind, and, if so, how has it taken place? What is the function of mind in relation to physical life, growth, and evolution? In this scientific form, the subject is of comparatively recent growth. It was the physiologists and the biologists who put the questions that animal psychology is trying to answer. If the answers are not yet given, it is because of the immense number of accurate observations and experiments that must be made, and the present inadequacy of the institutions and equipment provided for research. In America, Germany, and France, increasing attention

has been given in recent years to new methods of inquiry, far removed from the old haphazard observations on which the traditional psychology depended. That man's behaviour in many cases is directed by his mind is known in the first instance from the evidence of consciousness itself. While consciousness gives direct knowledge only of the subject's *own* mind, the inference to the minds of other human beings, through language, etc., is too forceful ever to be questioned. In the same way, no one, without a preconceived theory, hesitates to think of the higher animals, from the ape down to the bird, as having minds, and as governed by those minds so far as their behaviour is similar to ours, it becomes more difficult to admit mind in a frog, a fish, a crab, an insect, or, finally, in an amoeba. It is the argument from analogy that we must use, and we can do so in two ways. One is by comparing the *structure* of animals and of man, the probability or the degree of mind lessening as the body becomes more and more different from the human type. The other line of argument is from *behaviour*, and here what is necessary is the detailed analysis of animal actions, and of the conditions under which these actions take place.

The actions have been classified, in a scale of ascending complexity, as *tropisms*, *reflexes*, *instinctive actions*, and *acts of intelligence*. It will be noted that there is no common principle of division underlying these names; perhaps the position will be more easily understood when some account is given of each kind of action.

Tropisms. When a plant is placed in a window, its leaves are found to bend so that they turn their flat surface towards the light; the stem tends to grow upwards, the root downwards. These are instances of tropisms, which are best understood as actions by which a plant or animal responds to the *direct* action upon it of light, heat, contact, chemical or other agency. In the case of light, for example, some animals are positively "heliotropic," others negatively "heliotropic"; the former seek, the latter avoid, the light. The way in which this action takes place is said to be as follows: that when the light falls unequally upon the two sides of an animal which is symmetrically shaped, the side which is more strongly affected contracts or expands, as the case may be, more strongly than the other side; hence the animal turns until its head is pointing straight into the light or away from it. The whole process is regarded as entirely outside consciousness, and therefore as not depending at all upon the *will* (if any) of the animal. In the main, this simple behaviour includes most of the actions of the micro-organisms, the larvae of insects, and even the young of many of the lower vertebrates. According to Loeb, it is the type of all, even the more complex actions of higher animals, including man, or the element out of which these higher actions are constructed; in other words, all action, all behaviour, is physically, chemically, or physiologically determined; and mind, when present at all, is a mere accompaniment of the physical process, without influence on its result. But it is clear that the actions of lower organisms are much more complex than the "tropism theory" allows, that it does not, for example, explain the forward or backward movements after the turning process is accomplished; that the tropisms are liable to alteration by all sorts of incalculable internal conditions, such as food—repletion or the reverse; that there is no animal

whose behaviour is so simple as to consist of tropisms alone, but that from the beginning, even in the amoeba, there are signs of repeated trial in a case of difficulty, and of profiting by experience.

Reflex Action. Under this heading may perhaps be included all forms of behaviour in which the reaction takes place in a separate organ of locomotion or of expression, from that which receives the stimulus, the sense organ. Such actions, in the higher animals at least, are conditioned by the presence of nerve fibres and nerve centres. Take, for instance, the way in which animals respond to any sudden disturbance of their environment: by flight, by stillness ("shamming dead"), or by attack. Loeb tried to show that the fact of the nerve tracts contributing to such actions does not differentiate the action from a tropism; the nerves merely make it more effective, more rapid, more vigorous in proportion to the stimulus, and especially more usefully located; that in simpler animals the response *does* take place in spite of the absence or disconnecting of the nerve tract, only more slowly and more diffusively, and requiring a stronger stimulation to set it off. But, even if true, these things do not alter the fact that we use our sensations to guide us, under normal circumstances at least; and there is good evidence that primarily the reflex action was a sensational response in which consciousness was actively involved. So the question has an interest as to how far the sensations of animals are similar to our own. Do animals, for example, see colours in the same way as we? Many experiments and much argument have recently gone to the solution of this question in the case of insects (especially bees and ants), crustaceans, fishes, etc. The most effective method is one by which the animal is trained to discriminate edible matter when placed on one coloured background, and to neglect any other backgrounds of different colours. The difficulty which the "control" experiments have to avoid is that of introducing some other criterion than colour itself, to which the animals respond or by which they are guided: for example, odour, and especially brightness differences; for it is by no means certain that colours which have the same brightness to our eyes have the same brightness also to the eyes of a crab. What we regard as a difference of colour may to the crab be a difference of brightness simply (*i.e.*, of dark and light). On the whole, the evidence is in favour of the view that neither crustaceans, nor fishes, nor even birds, have any sense of colour; but that the differences they see are differences of brightness or intensity only. Even in the case of dogs and cats, the more probable conclusion is also that these animals are colour-blind, or nearly so. With bees, on the other hand, colour seems to play an important part in behaviour; recent experiments, by various methods, of Allard, Lovell, Turner, etc., show that bees distinguish blossoms mainly by their colour contrast with the background; that they learn to seek honey in artificial flowers of a certain colour, placed alongside others of the same colour in a different illumination and others of different colours, showing that it is not the intensity merely that guides them. On the other hand, there is also some evidence that animals which have colour-sense, as bees, stand on the second level—not the highest—of colour evolution (*i.e.*, that they can see yellow and blue, but are blind to red and green).

Instinct. Instinctive behaviour is defined to be

any action determined not by a simple *stimulus*, but by a *situation* or complex of stimuli, and which is not learned or acquired in the individual's experience, but is provided for in its structure at birth; and, therefore, is common to all members of a species except where differences of sex and of age intervene. Homing, nest-building, methods of hunting, attack, flight, migration, storing of food, care of the eggs or of the young, are well-known illustrations. The degree to which consciousness is present or is effective is a matter of dispute. It is said, on the one hand, that the instinct is wholly determined by physical conditions, and that therefore consciousness, if present at all, is merely a spectator and has no control of the event. Or again, that while the instinct-action on its first occurrence may run off without mental influence, all future actions of the same kind are affected by the experience of the earlier one. Or again, that while consciousness is not the driving force (the source of energy, as it were), yet it is the guiding or controlling factor throughout, and from the very beginning. The homing of bees, ants, and pigeons, for example, has for its instinctive, congenital element the discomfort of any animal in a strange situation, the "pull" of the nest upon an animal; but this "pull," however strong, will not bring it to the nest under *any* conditions. It does not know its way instinctively, but only by means of certain sensations, by using experience, memory—in short, by mind. So bees and wasps, when leaving a new nest, carefully study its surroundings, and find their way back to it by using some points of reference—landmarks, in short, just as a human being might. There are, of course, different kinds of landmarks from those which we should use. Practically the same is true of ants, and also of carrier pigeons.

"Trial and Error," or Intelligent Behaviour.

Under this heading may be classed all kinds of action which essentially depend for the form they take on what the animal has learned in its individual experience; cases, for example, in which a reflex action has come to be inhibited or checked, or in which instinct has been modified, or in which a totally useless trick has been learned through human instruction, or in which an older animal is imitated by a younger, etc. All forms of training, whether by man, by parents, or by Nature (change of environment, etc.), would fall under this head. The simplest form is that by which an animal seeks to escape from an unpleasant situation—strong light, heat, an obstacle, etc. The more complex is that in which a chicken, for example, learns to avoid certain caterpillars, which are poisonous and distasteful, and to reject them when offered. Many experiments, too, have been carried out on the way in which an animal learns to find its way to the centre of a "maze," or to find its way out of "puzzle boxes," fastened by a latch, a string, a lever, or other unnatural means from the animal's point of view; the animal's intelligence is estimated from the time it takes to learn by a number of trials, from the ease with which it reduces the time of trial in subsequent experiments, from the length of time it retains a habit so formed, from the variety of the habits it can form, and from the way in which what it has learned in one situation is applied or transferred to different situations. The general opinion is that all animals, from the lowest upwards, show some signs of such a power of learning, and therefore of "intelligence"; that the more complex

the organism, and the more varied the situations in which an animal is normally placed, the greater the degree of intelligence, in our sense of the word, it shows. Further, it is clear that instinct and intelligence are not separate and independent conditions of animal behaviour, as Bergson, for example, makes them, but that instinct forms the basis on which intelligence works; instinct throughout furnishing the starting-point, but nothing more, intelligence, more and more comprehensive in its scope as we ascend the scale, controlling, modifying, and even reversing instincts, deciding between competing claims, etc. It is also clear that mind has been, in the *evolution* of species, as it still obviously is in the *development* of the individual, not only an accompanying process to physical changes, but a cause, or at least a directive influence.

J. L. M.

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ANIMATISM.—(See ANIMISM.)

ANIMISM.—Animism is the belief in a soul. Thus the position of a modern philosopher may be termed "animistic," if he hold that the soul exists as a principle essentially independent of the body, and as such capable of interaction with it. In this sense, Mr. W. McDougall entitles a recent work, in which such a view of the human soul is upheld: *Body and Mind: A History and a Defence of Animism* (London, 1911). Contrariwise, the doctrine that consciousness is, in Huxley's phrase, an "epiphenomenon," a mere by-product of the body, and the slightly different theory that mental process runs parallel with physical process, so that neither determines the other in any way, alike savour of what has been called "a psychology without a soul." The history of the word, however, links it less closely with philosophy than with the sciences of anthropology and comparative religion. After all, Animism of the philosophic type is but a refinement of a far more widely-spread and popular form of belief. Moreover, though Stahl, early in the eighteenth century, coined the term to express his medico-philosophic doctrine of an *anima mundi*, it lay virtually dormant for a century and a half, when Sir E. B. Tylor called it back into use to denote the attitude of mind which he postulates as the basis of primitive religion. To pass by certain earlier and less complete statements of his theory (such as the *Fortnightly Review*, Aug., 1866, 71 f.), we find it elaborately set forth by him in *Primitive Culture* (1st edit., 1871). Now, it would appear that the theory embraces two doctrines which need not necessarily be held together, and that to each, in turn, the name of Animism is assigned by Tylor. Thus, firstly, the burden of three chapters (VIII—X) dealing with the subject of mythology is to show that man has a primordial impulse to personify inanimate objects and powers. In this connection, Animism is defined as "the belief in the animation of all Nature, rising at its highest pitch to personification" (I, 285 of 4th edit.); secondly, when in succeeding chapters (XI—XVII) a basis is sought for primitive religion and philosophy, as apart from mythology, this is found in Animism defined as "the belief in spiritual beings" (*ibid.*, I, 424). Such spiritual beings are either "souls of individual creatures, capable of continued existence after the death or destruction of the body"; or "other spirits, upward to the rank of powerful deities" (*ibid.*, I, 426). The origin of the belief is explained as follows: "It seems as though thinking men, as yet at a low level of culture, were deeply impressed by two groups of biological problems. In the first place, what is it that makes the difference between a living body and a dead one; what causes waking, sleep, trance, disease, death? In the second place, what are those human shapes which appear in dreams and visions?" The answer they gave to the first problem was that every man has a life, enabling his body to feel and think and act, but capable of leaving it; and, to the second, that he has a phantom, equally separable from the body, since it may appear to others at a distance. Combining the life and the phantom, they arrived at the conception of what Tylor describes as "the ghost-soul" (*ibid.*, I, 428-9). As for spirits, this part of the animistic theory asserts that "the ideas of souls, demons, deities, and any other classes of spiritual beings, are conceptions of similar nature throughout, the conceptions of souls being the original ones of the series" (*ibid.*, II, 109).

Animatism. It is to this second doctrine that

special interest attaches, inasmuch as Tylor maintains that Animism in the sense of the belief in spiritual beings, of the type of the separable ghost-soul, is able to provide "a minimum definition of religion," and hence the groundwork for a philosophy of religion (*ibid.*, I, 426). That the second doctrine does not necessarily accompany the first is shown by the fact that Herbert Spencer refused to believe in any primitive tendency to impute animation to all Nature; while he, too, sought the origin of religion in the theory of the human ghost-soul, and even claimed priority for this view as against Tylor, on the ground that he had long ago argued (in the *Westminster Review*, 1854, 360-1) that "the aboriginal god is the dead chief" (see *Mind*, II, 1877, 415 f.). It would seem better, then, for the general purposes of anthropology, to reserve the word Animism for Tylor's second doctrine (namely, that of the separable ghost-soul with which his whole theory of primitive religion is bound up), and to designate the first doctrine by some distinct though cognate expression. To supply this need, the term "animatism" has been proposed (R. R. Marett, *The Threshold of Religion*, 2nd edit., 1914), and has been widely adopted. Animatism, then, is the recognition of animation in the sense of conscious life and personality in bodily things; Animism is the recognition of an *anima*—a soul or soul-like principle, that, while it is the vehicle of conscious life and personality, is either separable from the body or is independent of body altogether.

Criticisms and Amendments. Half a century of discussion has left the theory of Animism, taken in this sense, almost unmodified as regards the proposed explanation of the origin of the conception of a ghost-soul. Thus Mr. McDougall, a trained psychologist, who has likewise had first-hand experience of savages, writes: "There can be no reasonable doubt that Tylor has given the true account of the origin of Animism in attributing it, in the main, to reflection upon the experiences of dreams and visions, in conjunction with the objectively observed facts of sleep, trance, and death" (*op. cit.*, 2). A view put forward by Mr. A. E. Crawley that primitive man derived his ideas of the souls of men and things from the visual images of waking life (see *The Idea of the Soul*, esp. Ch. V) has met with little support. If a modern version of the matter were to differ from Tylor's, it would be simply in this way: that what he represents as a purely psychological development, namely, a process of reflection on certain facts, would nowadays be given a wider basis by being likewise considered in relation to the social conditions which brought those facts prominently into notice. Thus, for example, it might be shown how the practical need of disposing of the dead occasions funeral ceremonies, in the light of which the belief that the individual, though dead, continues to enjoy rights as a member of society, gathers force and meaning. When we pass on, however, to examine recent criticism of the validity of the Tylorian theory of Animism regarded as an all-embracing account of primitive religion, it cannot be so confidently declared to hold its ground unchallenged. The theory has been attacked, as it were, at both ends. On the one hand, it is contended that it is pushed too far when the idea of the ghost-soul is held capable of generating the idea not merely of an incorporeal spirit, but even that of a supreme deity. On the other hand, it is suggested that it is possible to push back the origin of religion beyond the

evolutionary stage at which the notion of the separable ghost-soul comes into being. The late Andrew Lang was the protagonist of the view that some gods at least originate outside the sphere of Animism. In *The Making of Religion* (1st edit., 1898) he studies certain "high gods of low races," whom he finds to be "magnified non-natural men" rather than ghosts or spirits. Thus he cites the Fuegian who, when his brother had killed a "wild man" for stealing his birds, said: "Rain come down; snow come down; hail come down; wind blow, blow; very much blow. Very bad to kill man. Big man in woods no like it; he very angry" (*op. cit.*, 2nd edit., 174; cf. Fitzroy, ii. 180). Such a "big man" is not necessarily envisaged as an incorporeal spiritual being any more than Apollo was by the Greek. Some of Lang's most striking instances are drawn from South-East Australia. According to A. W. Howitt (*cf. his The Native Tribes of South-East Australia*, 1904, esp. 488 f.), several tribes of this region recognize "a tribal all-father," the supernatural analogue of the tribal headman. "He can be invisible; but when he makes himself visible, it is in the form of an old man of the Australian race." Such an anthropomorphic being represents "a venerable, kindly headman of a tribe, full of knowledge and tribal wisdom, and all-powerful in magic, of which he is the source, with virtues, failings, and passions, such as the aborigines regard them" (Howitt, *ibid.*, 491, 500-1). How such anthropomorphism might arise independently of the belief in the ghost-soul and become a source of religion, Lang did not try to explain in the first edition of his book (see 1st edit., 170), but in the Preface to the second edition he suggests: "As soon as man had the idea of 'making' things, he might conjecture as to a Maker of things which he himself had not made, and could not make. He would regard this unknown Maker as a 'magnified non-natural man.' These speculations appear to need less reflection than the long and complicated processes of thought by which Mr. Tylor believes, and probably believes with justice, the theory of 'spirits' to have been evolved" (2nd edit., Ch. X). Whatever be the ultimate verdict of science on these speculations, it would seem to be the fact that savages who show no signs of having climbed the long ascent that, according to the Tylorian theory, leads from Animism through polytheism to the more or less monotheistic conception of a supreme deity (*cf. Tylor: op. cit.*, II, 331 f.), may, nevertheless, entertain some notion of a supreme being, of anthropomorphic rather than animistic form, as a rallying point for such religion as they may be thought to have.

Fetishism. At the other end of the scale, the Tylorian scheme which supposes the first beginnings of religion to coincide with the rise of the animistic belief, has been assailed on the ground that there also exists a "pre-animistic religion" (*cf. R. R. Marett, op. cit.*, Ch. I). Tylor himself allows that, in the case of an "endless multitude of objects, to which ignorant men ascribe mysterious powers, we are not to apply indiscriminately the idea of their being considered vessels or vehicles or instruments of spiritual beings." If an animistic interpretation is put on the activity of such objects, we have "fetishism," a form of worship and, hence, of religion. "To class an object as a fetish demands explicit statement that a spirit is considered as embodied in it, or acting through it, or communicating by it, or at least that the people it belongs

to do habitually think this of such objects; or it must be shown that the object is treated as having personal consciousness and power, is talked with, worshipped, prayed to, sacrificed to, petted or ill-treated with reference to its past or future behaviour to its votaries." Otherwise, the object in question is not a "real fetish," though it be kept "for luck," or be regarded as capable of "working by imagined conveyance of special properties" (*op. cit.*, II, 144-5). It will be noted that, in order to cover the facts which, on his own view, fall under fetishism, Tylor has to relax his definition of animistic religion; so that the notion of the separable ghost-soul is transcended, and whatever is treated as having personal consciousness and power is brought within its sphere; so that we are back in mere animatism. Meanwhile, the primitive recognition of what Tylor terms a "mysterious power" inherent in things has recently received much attention, the first impulse to such studies being given by Dr. R. H. Codrington's account of the belief in a "supernatural power or influence" called *mana* throughout the Pacific region. He states that "all Melanesian religion consists . . . in getting this *mana* for one's self, or getting it used for one's benefit—all religion, that is, as far as religious practices go, prayers and sacrifices" (*The Melanesians*, 1891, 119). He adds, it is true, that "this power, though itself impersonal, is always connected with some person who directs it; all spirits have it, ghosts generally, some men" (*ibid.*). Thus it would seem that Melanesian philosophy has reached a stage at which *mana* is likely to be dominated by animism. Still, it seems probable that, when, as in one of Codrington's examples, a man argues that a stone resembling the fruit of a certain tree must have the *mana* to produce an abundant crop if it be buried at the root of the tree, he is moved directly by the mysterious resemblance, and thinks that it owes its *mana* to an associated spirit by a kind of afterthought. Generally speaking, then, we may postulate that things seeming to make for luck may have a religious value for the savage, quite apart from any clear idea on his part that a ghost-soul is behind the luck. It seems artificial to draw some hard-and-fast line at the point where Animism appears to cease, and to designate the residual element as the mere raw material of religion waiting for the informing touch of the animistic theory to invest it with definitely religious value. Tylor might well answer, however, that he has purposely limited his conception of religion by considering its intellectual, rather than its emotional, side throughout (see *op. cit.*, 358-9). Where there is no clear idea, but simply a vague sense of mysterious powers working for man's weal or woe, his analysis he might say, perforce comes to a standstill. Certain it is, that, within these self-imposed limits, the theory of Animism is elaborated with a systematic thoroughness that reveals the few simple principles serving as the framework of a vast mass of multifarious beliefs and practices; and that, if the other theories which have just been reviewed have any justification, they must be regarded rather as supplementing than as annulling Tylor's cardinal doctrine.

R. R. M.

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ANOMALIES IN THE ADMINISTRATION OF EDUCATION.—The average Briton is supposed to revel in illogicalities. He should therefore be perfectly satisfied with our educational system, for almost every department of its administration abounds with contradictions and practices utterly at variance with the conclusions of those who have made education their life-study. The Board of Education, for example, is supposed to take the lead in educational effort. We might, therefore, naturally expect that its permanent officials and subordinates are experts who have graduated from the scholastic profession to their present positions. Such expectations are doomed to disappointment, for almost the last qualification demanded of a Whitehall official is practical experience in teaching. It is not many years since the possession of such experience was an absolute barrier to admission within the charmed official circle, and even now the subordinate posts only can be fairly described as open to the practical teacher. Every soldier in Napoleon's army may have carried a marshal's bâton in his knapsack, but our rulers have decreed that no such remark shall be made with regard to education. No one with practical knowledge of child-training need cherish ambitions regarding the high permanent posts of the Board of Education.

Local Committees. The method of choosing members of local Education Committees is another anomaly which the "intelligent foreigner" may well regard as a reflection on our national sanity. Previous to 1903, local administrators were compelled to acquire some knowledge of the principles of education. The activities of School Boards were concentrated on the management of schools, and, with all their differences over theology, some considerable measure of success was achieved. Their members, being elected for the work of education and that alone, were obliged to obtain some knowledge of their duties; but their successors need not attempt to understand the educational requirements of the nation's children. They are chosen mainly from the ranks of the local councillors, who owe their election to municipal bodies to a variety of reasons, zeal for education not necessarily being one. It is true that outsiders may be co-opted to Education Committees, but the latter also rarely contain more than an insignificant minority of practical educationists. Teachers are eligible for such co-option; but Education Committees having the right to refuse this privilege, many committees have thus lost the advantage of expert advice and assistance.

In the Schools. When we enter the schools themselves, we are again faced with anomalies. In Law, none but a trained and qualified man may give professional legal advice; in Medicine, the unqualified person dispenses drugs and performs operations under peril of manifold pains and penalties; in Education, however, professional attainments are often relegated to a very subordinate position.

Thus it comes to pass that we have in our schools three classes of teachers: fully qualified, partially qualified, and those whose only qualification is the possession of certificates showing that their holders have reached the age of eighteen. The latter class is entirely composed of women, and the policy of the Board of Education for several years has been to restrict their employment to infants' schools. Here, again, we are confronted with an anomaly. "Give me the child and you can have the man," has been the maxim of educationists from time immemorial. "The hand that rocks the cradle rules the world" is another adage of almost equal antiquity. Both imply that early training is of vital importance to the future of the race. The Board of Education has accepted this dictum in many a document and order; but in the past it has encouraged the entrance of absolutely unqualified teachers into the schools, and even now is engaged in concentrating their pernicious influence on the tender years of infancy—the period when the capable and skilful teacher can be most effective in developing the immature faculties.

The number of unqualified supplementary teachers is extremely large in agricultural areas, though for the whole country the proportion of unqualified teachers to the total teaching staff is little more than 8 per cent. (These are, of course, pre-war figures.) In many urban areas, Education Committees have pursued the statesmanlike policy of reducing the number of unqualified teachers. In such districts as Accrington, Canterbury, Grimsby, Ilford, Kettering, Plymouth, Swindon, Walsall, and several others—none of which can be described as wealthy—they are non-existent. In other urban and industrial areas, unqualified teachers are a negligible quantity, and only remain as appointments made before 1903. It is only when we examine the staffs of agricultural districts that we discover Education Committees who place a premium on lack of professional qualifications and ability. These bodies, with one or two exceptions, are filled with a great faith in the capacity and power of the unqualified teacher. Some disguise their faith under the plea of poverty; but this pretext at once crumbles away when we discover that the rateable value of rural districts is proportionately higher than that of areas controlled by city, town, or urban district councils. The penny rate in Birmingham, for example, yields 2s. 4d. per child, as compared with 3s. 1d. in Warwickshire. The figures for Carlisle and Cumberland are 2s. 3d. and 3s. 2d. respectively; while Hampshire can rely on 3s. 1d. per child, as against 2s. 7d. for Southampton. We must, therefore, accept the statement that agricultural districts prefer unqualified teachers as the guides and shapers of their children's destinies not because of their poverty, but for some entirely different reason. Why does Hampshire, for example, employ 307 unqualified and 450 qualified assistant teachers; while its poorer neighbour, Southampton, has only nineteen unqualified assistants against the 372 who possess the full teaching diploma? Carlisle has six unqualified and 133 qualified assistants, but the comparatively wealthy county of Cumberland has 173 and 196 respectively. Again, the question arises: "What is the reason for this difference?" It cannot be that brains are not necessary for success in agriculture, seeing that this industry demands a maximum of skill and intellectual effort from its devotees, as Denmark has discovered. The excessive

employment of unqualified teachers must, therefore, be regarded as another educational anomaly. Professional qualifications are requisite for securing the recovery of 2½d. from a recalcitrant debtor, or for tiding one through an attack of measles; but when the destinies of our nation have to be shaped, or our most vital industry saved from ruin, professional qualifications are not only considered unnecessary, but in some cases, absolutely injurious.

Primary and Secondary. Children in secondary schools usually come from healthier surroundings than those in primary schools. Consequently, the sanitary and hygienic regulations for secondary schools must be more stringent than in the primary school. Sixteen square feet of floor must be the minimum accommodation in the former case; but in the latter, ten square feet (with an occasional reduction to eight) is regarded as ample. All educationists are agreed that individual care and attention are essential for the proper development of the faculties and the right moulding of character. Here, again, the need is greater in the early years. Therefore, says the Board of Education, the older children in secondary schools must be taught in classes of not more than twenty or thirty, but classes of sixty will meet all the requirements of the younger children in primary schools. The British nation loves anomalies, and its complacent rulers satisfy the demand. With perfect truth did the French philosopher write: "Every nation gets the Government it deserves." A. W. D.

ANSELM.—The great Archbishop was born in Piedmont, in 1033. Attracted by the name of Lanfranc, Abbot of Bec, in Normandy, he entered that abbey in 1059, becoming prior and afterwards (1078) abbot. The abbot was one of the most famous schools of the eleventh century. Anselm left Bec in 1093 to become Archbishop of Canterbury, and while holding that office was involved in many disputes with William II and Henry I. The firmness and vigour displayed by Anselm in these quarrels indicate his resolute character. His writings display the depth of his intellect: they include philosophical and religious treatises, meditations and letters. He died in 1109 and was buried at Canterbury.

ANTHROPOLOGICAL INSTITUTE, THE.—The studies of the anthropologist are devoted to the subject of man's place in the animal kingdom as determined by his physical, mental, and moral powers; the history and development of the human race and all its institutions.

Physical anthropology deals chiefly with measurements, especially of the skull, and is valuable in providing material for classification and tests of efficiency and character, as shown by the stature, facial angle, and the dimensions of the skull. Ethnology is a branch of the science dealing with the history and development of races, and here religion is of first importance. Another branch, Archaeology, deals chiefly with the remains of antiquity, the epochs of man's history as shown by geological research, and the history as shown by relics of man's work.

The Royal Anthropological Institute was founded in 1871 by the union of the Ethnological and the Anthropological Societies of London, under the title of the Anthropological Institute. The first President was Sir John Lubbock (afterwards Lord

Avebury). In 1907 the Institute was incorporated as the Royal Anthropological Institute. The work of the Institute is of national importance in collecting information on the manners and customs of the various races living under the British flag. The Institute publishes annually an illustrated *Journal* recording its proceedings, and also an illustrated monthly review called *Man*.

Meetings are held regularly for the reading and discussion of papers on subjects connected with alien races, and such pre-historic remains as bear upon the origin and development of modern races and their customs. An extensive library has been collected containing works dealing with every branch of anthropology.

The members of the Society are known as Fellows, and are elected by the Council on the recommendation of two existing Fellows. The annual subscription is two guineas, which entitles a Fellow to the *Journal*, to attend meetings, and to the use of the library.

The office of the Institute is at 50 Great Russell Street, London, W.C.1.

ANTHROPOLOGY IN RELATION TO EDUCATION.—Anthropology is usually defined with some pomposity and in such terms as the following: In its scope, Anthropology embraces all branches of study relating to Man. It aims at the co-ordination of evidence from all those sources, with a view to the appropriate regulation of human conduct.

The programme thus outlined is pretentious and vast, but it is not new. Anthropologists proclaimed it fifty years ago in no uncertain tones. Its opponents foretold an inevitable and early collapse by reason of its unwieldy and indefinite form. But Anthropology has survived many rude shocks. Perhaps the seeming incoherence of its constituent elements has not been disadvantageous.

The early advocates of Anthropology were treated like most pioneers of reforms. Their trouble increased when they began to urge the necessity for public recognition of Anthropology on the ambitious scale mentioned above. A band of these neophytes became very notorious in the early "sixties" of the nineteenth century. In 1862, they broke away from a respectable parent society which had maintained a blameless and uneventful existence for some twenty years. The seceding party formed an "Anthropological Society," and the members of this turbulent sect debated a variety of vexed questions with the utmost freedom of expression. Adverse criticism and vigorous condemnation were not far to seek, but evoked only a spirit of rancour tinged with the more pleasurable sensations of martyrdom. The anthropologists were, indeed, more enthusiastic than discreet. They attacked their own parent (the Ethnological Society). They turned upon Exeter Hall, and indicted savagely the working of British missions to the heathen. They consorted with Bishop Colenso, and discussed the delicate political problem of the "Rights of Man." Even the Federal cause in the American War of Secession (then raging) was not held sacred by them, and their debate on the negro's place in Nature is truly monumental. By certain sections of the Press, anthropologists were associated with "infidels and heretics," a taint requiring decades for its removal. I lay stress on the indiscretions of these zealots, for as "men of

the world" they should have known and behaved better. They were undoubtedly most capable and far-seeing. They realized the necessity for a long probationary and preparatory period in the training of an anthropologist. They held that nothing less than the support of the public in general, and of the Government in particular, could meet the claims of so potent a factor in the well-being of a nation. But they alienated the clergy, they offended the orthodox laity, and they must have appeared to politicians as "faddists" inoculated with dangerous anarchical tendencies. And, in short, though they prophesied that eventually "the public will see that it is for their own interest and for the benefit of humanity at large, that the scientific study of Man shall be made a part of national education," they adopted methods that did not tend to a speedy consummation of those hopes and desires. In the sequel, the fuller recognition of Anthropology was delayed for nearly half a century. The delay is regrettable and important. An immense amount of patient "spade-work" must needs be done (in a variety of spheres of observation and action) before the foundations for practical application have been truly laid. The early anthropologists knew this. Usually they were careful not to prejudge the results. They saw that, in application to political problems, protracted study by men of special competence would be needed. Yet their ardour overcame their common sense. The general tone of their debates—as, for instance, those dealing with ethnic boundary lines and frontiers—is interesting, but the conclusions were often dubious and the arguments unconvincing. Gratifying progress has been made in these matters by those who have replaced the ardent spirits of the Mid-Victorian epoch.

But whatever mistakes the pioneers of the Science of Man may have made, they defined fifty years ago the main outlines of Anthropology in relation to the intellectual equipment of a civilized nation. Moreover, some of those pioneers did remain level-headed. And I would sum up this part of my article by comparing the conclusion of the whole matter as set forth on two occasions separated by an interval of forty-seven years. Thus, just as, in 1866, Mr. Harris insisted upon "tolerance of the opinions of others" as the hall-mark of the anthropologist, so Sir Richard Temple, in 1913, proclaimed that "Sympathy is the root-principle of applied anthropology." Such claims demand consideration by those entrusted with the construction and direction of educational schemes.

Scope and Development of the Science. In the growth of Anthropology, four main lines of development have been pursued. No order of precedence is recognized. The subdivisions relate to: (a) Social institutions, including all the social relations of a human community; (b) religious and magical institutions; (c) all arts and crafts with reference to their origin, distribution, and the principles of division of labour; and (d) Physical Anthropology, under which head falls for consideration the adaptation of Man to his surroundings, whether the latter be modified by sanitary measures or not. With this side of Anthropology, the study of Physiology is inextricably interwoven, as is Psychology; and, in fact, the latter science is intimately connected with every division mentioned above.

Reference is made above to the view held in 1913 by Sir Richard Temple, who then (as President

of Section H [Anthropology] of the British Association surveyed the application of Anthropology to modern national requirements. The address is very valuable in the present place, since reference to it will obviate the necessity for setting out in detail the tale of teaching centres. (See References, *infra*.) Here it is more important to dwell on another side of the survey. As an administrator of long experience, Sir Richard Temple is particularly well qualified to deal with the preparatory training of those entering the Imperial services. And he concludes that instruction in Anthropology is an essential part of such preparation. His conclusion on this question is accompanied by a sketch of the manner in which a knowledge of Anthropology should be applied in practice by administrators. Attention is due specially to the definition given of "administration." From this, political actions are expressly excluded. For Sir Richard Temple frankly abandons all hope of persuading politicians to study or to apply what may be termed anthropological methods.

Anthropology at the Universities. Instruction in Anthropology has been available for many years at some of the universities, and in at least four of these students can proceed to a degree. Each school has its own special features, yet with uniformity the schemes of instruction recognize the main divisions of Anthropology as set out above. I will add a few words of special reference to the University of Cambridge. Much activity has prevailed here since 1904; and by 1914 a Tripos, a Diploma, and an Ordinary Degree (for Research students) in Anthropology has been instituted. The success which attended the manifold labours of the Board of Anthropological Studies testifies to the unanimity of its members and to the benevolent attitude adopted by representatives of other departments in the University. Abundant evidence could be adduced of the potent influence of Anthropology in producing convergence of such interests and studies as may seem widely separated. And I am sure that the testimony drawn from other universities would confirm this view.

Up to the present, students at Cambridge have been, for the most part, Civil Service candidates on probation, older Civil servants on leave, or missionaries engaged in foreign countries. The institution of the Anthropological Tripos brings the subject into line with others open to students who enter the University with a view to taking an Honours degree in due course. Time alone can show the number of candidates, but these will include some who will subsequently pass to secondary schools for the profession of teaching.

Anthropology in Secondary Schools. The future of Anthropology will rest with these men to no small extent, and I direct attention to the importance of instructing the prospective schoolmaster in its elements. Much will follow in time upon the step thus to be taken. And this consideration should be kept in mind with regard to Anthropology at the universities.

Museums. In conclusion, a brief reference will be made to museums as teaching centres. University museums are among the best of their kind, and naturally play an important part in the scheme of instruction. Under Sir Charles Hercules Reid, the ethnological and other collections of the British Museum have been greatly augmented, and their

use has been vastly extended owing to the system of demonstrations (*i.e.*, personally conducted tours for inspection and instruction) now in vogue. Although they are the most conspicuous examples, the national collections do not stand alone; and, in several other instances, museums are employed largely in connection with lectures. The development of anthropological instruction on such lines seems pre-eminently indicated as the path along which public recognition should travel.

By way of summary, I would say that I have tried to show that an important place has been claimed for Anthropology in national education for the last half-century. Delay in public recognition is due partly to mis-directed zeal on the side of the anthropologists. But Anthropology has been fostered at the universities and is now firmly established in university studies. Judging by the past and by other instances, anthropologists will do well not to rely on the success of deputations to the Government. The latter already takes notice in a small way, especially in connection with the national collections. And national recognition will be most easily extended in that direction. Instruction in its wider aspects is now possible only in the universities, where a variety of subjects can be handled owing to the number of teachers available. These aspects of Anthropology which may be described as of Imperial importance, will be attended to by the Imperial Bureau of Ethnology when that has been founded. The universities will with equal propriety envisage a wider range and encourage research into a variety of complementary subjects.

W. L. H. D.

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ANTHROPOLOGY IN RELATION TO EDUCATION.—Anthropology, the science of man, comprehends all that man is and all that man does: it deals with the nature and evolution of man as an organism; it studies the constitution and development of the human mind; and it traces the growth of the specifically human activities as manifested in culture, institutions and beliefs. It therefore necessarily comes into relation with education at many points and in various ways. Its conclusions afford guidance to the educational theorist; while the data upon which these conclusions are based furnish the teacher with endless material for instruction in those subjects in which the interest and importance lie in their relation to, or bearing upon, the humanistic, as opposed to the abstract and materialistic, elements in education as a preparation for life. Although it is impossible to deal exhaustively with a subject of so wide a scope within the limits of a short article, a few

general conclusions are offered for consideration, methods of treatment of certain subjects of the curriculum are suggested and sources of information of value as aids in instruction, are indicated.

A rough classification of anthropological subject matter which, if not strictly scientific, is sound enough for practical purposes, divides the science into two main parts: Physical Anthropology, and Cultural Anthropology. The first deals with man as a physical organism; it studies him in his relation to other members of the animal world, investigates his bodily form and his parts, their functions and their relation to one another, and classifies the different varieties of man according to their resemblances or differences. This division of the science is based upon the comparative study of human anatomy and physiology. Human psychology, in so far as it has a physical basis, also belongs to this section, but it tends to come into close contact with cultural anthropology when it deals with the results of purposive action and conduct, especially when considering the springs of action of man in those relations with his fellows that form the subject matter of sociology.

The second-named division, Cultural Anthropology, deals with specifically human activities, that is with man as a rational talking being, living in relation with other human beings, and having certain necessities, bodily and mental, which have to be satisfied from the provision afforded by his environment.

These two main divisions of the science do not stand in identically the same relation to education. While both may furnish subject matter for instruction, and as such affect the curriculum, the first also provides the educationist with information about the subject of education, *i.e.*, the scholar.

Anthropology and the Scholar. The report of the Inter-Departmental Committee on Physical Deterioration, published in 1904, disclosed the fact that very little material was in existence that could serve as a standard of comparison in ascertaining the facts as to whether our modern population did actually present any signs of deterioration. It was, however, largely as a result of the findings of that Committee, that a medical service in connection with education was instituted. This service is intended to detect and remedy influences making for deterioration, in so far as this is possible by medical means, before they have obtained any strong hold on the physique of the scholar. The medical service is handicapped in the same way as the Committee on Physical Deterioration, by the fact that there is still very little accurate scientific knowledge of the standard of physique for the country as a whole. The medical service, however, only comes into contact with the scholar at stated intervals. The teacher has a far more intimate knowledge of the individual, his physical and mental characteristics, and possibly of his environment and conditions of life outside the school. In view of this more intimate knowledge it is to be expected that every teacher who is interested in his pupils will watch them and will bring to the attention of the medical officer any case which he thinks requires special notice or attention. But before this can be done the teacher must be able to distinguish between the normal and the abnormal. Although the data are not

complete, anthropological investigation has gone sufficiently far to show that the population of England is composed of several different physical types, varying in stature and other elements in their physique, as well as in mental characteristics; and although in modern conditions local peculiarities are no longer so sharply distinguishable as they once were, it is still true that certain physical types tend to be found concentrated in certain districts, as for instance among the inhabitants of the Eastern Counties, where the prevailing type is tall and fair, while in the West and in Wales, a shorter darker type of man is predominant. A teacher, brought suddenly from an area inhabited by a tall fair population into a district where the prevailing population was short and dark, might, without knowledge of the standard type of the area, be inclined to regard his scholars as stunted and showing signs of physical deterioration.

The same applies in the case of mental characteristics. The teacher should have knowledge of the normal psychological type, first of all of the country as a whole, and secondly of the particular area from which his pupils are drawn, in order that he may be able to distinguish the abnormal and the defective. In this direction anthropological science, at present, pending further investigation, will be found to be suggestive rather than of definite assistance. It is to a great extent a new field, in which much yet remains to be done. The same applies to a great deal of research work which aims at providing the teacher with tests to enable him to state on scientific evidence that any given child at any given age is sub-normal, normal, or hyper-normal in intellectual development, and to serve as an effective guide in promotion. In these cases the racial factor is no doubt of importance, but its influence is still obscure. The assistance of the teacher in this field of research is invaluable to both anthropologists and psychologists.

A further subject of inquiry that should be taken into account by the teacher in dealing with his pupils is that of heredity and environment and their effect on conduct, which have an essential relation to moral training, rewards and punishment. Here anthropological science provides a mass of material in the statistical studies of Professor Karl Pearson and the Biological School, and in the literature dealing with psycho-physics, atavism, degeneracy and criminal responsibility.

Anthropology and the Curriculum. From the point of view of the curriculum the interest of the teacher in anthropology lies very largely in the fact that it provides an almost inexhaustible source of illustration in various subjects. Before touching on this in some detail it may, however, be pointed out that an acquaintance with the methods of investigation and the subject matter of the science should have the effect of broadening the point of view and quickening the interest of many of the subjects now taught. Cultural anthropology is largely psychological in method. It collects, sifts and classifies facts, but its object in so doing is ultimately to arrive at a knowledge of the character and development of the human mind, the motive force which has brought these facts into being. Given this as his standpoint, the teacher should be able to vitalize and humanize the dry bones of his subject, while the fact that the greater part of this material is drawn from the life of the savage and

strange peoples appeals to the instincts and interests of both boys and girls.

The question of the distribution of man in space, the origin, relation and distribution of the various races of mankind, is one that is, as a rule, already

comparatively late period that the early British legends embodied in the Mabinogion, the sources of Arthurian legend and other traditional stories, can be utilized as evidence for the modes of life and customs of our ancestors. For earlier periods the weapons, implements and utensils, as well as the skeletal remains with which these are so frequently found in association in graves or burial mounds, furnish our only evidence. To ascertain the methods of manufacture of these utensils and implements where this is not clearly indicated by the articles themselves, recourse must be had to the practices of savages who stand at what is approximately the same level of culture—as for instance in the parallel which has been drawn between one period of the Palaeolithic Age and the modern Eskimo. By the employment of this comparative method, it becomes possible to construct with very fair completeness, a picture of life in this country during the chronological sequence of the Old Stone, New Stone, Bronze and Iron Ages, which correspond approximately with successive incursions of different races into this country. These waves of migration, in conjunction with the later historical invasions of Saxon, Dane and Norman, afford the basis of an explanation of the character and distribution of the types of our population of the present day, while the influence of their culture and characteristics can with reasonable probability be traced in the

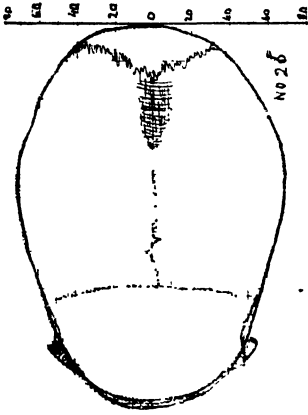


FIG. 1.

Dolichocephalic Skull of the Neolithic Age, from Coldrum, Kent.

included to some extent in the teaching of geography, although not always upon lines generally acceptable to the anthropologist. It is a common experience to find geographical text-books in general use that deal with questions of race and the main types of man on lines that are quite antiquated.

Following on the study of the distribution of man in space, and the study of the differences in physical character that distinguish one race from another, the study of the natural features of the environment, which is the essential element in regional geography, should be accompanied by an exposition of the effects that have necessarily arisen from the character of this environment in moulding the mode of life of the peoples inhabiting that area, these effects being studied in the first instance in the life of the more primitive savages and proceeding to the more complex conditions of a higher civilization. Parallel with this progression, however, in the ethnographic treatment of the material which studies man as distributed in space, there is also the method that studies human development in time—the method of archaeology. This parallelism brings history and geography into close relation. The similarity between the primitive savage of to-day and the earliest ancestors of the people who now live under the higher complex conditions of modern European civilization, can be demonstrated, and in the latter case the course of development can be followed *pari passu*, and, for most periods, illustrated from peoples now existing at varying stages of civilization ranging from the stone-using savages, through barbaric systems similar to those of the Middle Ages, to the modern European.

The beginnings of civilization in Western Europe, including our own country, must necessarily, from the circumstances of the case, be based entirely upon material evidence. It is only at a

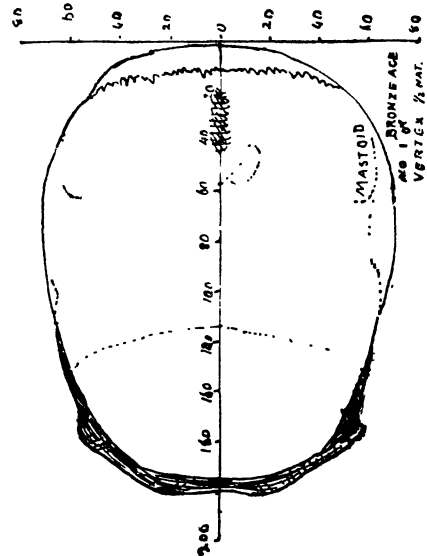


FIG. 2.

Brachycephalic Skull of the Bronze Age, from the Isle of Wight.

whole course of the development of our history and our literature.

It is now generally recognized that for a proper understanding of our own history and culture, some knowledge of continental history, and in particular of that of Greece, Rome and Egypt, is requisite. But to comprehend the historical period in these countries, it is necessary to know something of the results which have been achieved by

the archaeologist in elucidating the pre-history of the Mediterranean area. Pre-dynastic and dynastic Egypt, Mesopotamia, Minoan Crete, Mycenaean Greece and pre-historic Italy have each in turn played a paramount part in determining the development of civilization. And from this early centre of development there filtered along the trade routes, both with the coastal trade along the shores of Western Europe, and by the land routes across Europe to the Baltic, influences which endured, as shown in the decorative art forms of Ireland and the Teutonic peoples, until well into the Middle Ages.

It is hardly necessary to emphasize the importance of archaeological studies in the Mediterranean area, and in particular in Egypt, Asia Minor, Palestine and Mesopotamia, in relation to religious instruction and Bible history. Without some acquaintance with the results that are slowly being yielded by research in this field, it is impossible to attain the knowledge of the relations of early Israel with surrounding peoples and cultures that is necessary to place its history in proper perspective. In the same way, comparative study of the religions of early Babylon and Assyria and of Semitic religions generally has thrown a flood of light on the early religion of the Israelites, by bringing out the meaning of practices and beliefs that had been skilfully worked over by later writers to fit in with more highly developed conceptions of the deity. In the case of both the Old and the New Testament, the material furnished by study of the modern Bedouin and Fellaheen of Egypt and people of the desert, as well as of the modern inhabitants of Palestine, has filled in the background and vitalized the details of the picture of the life of Israel throughout the period with which the Bible deals.

In addition to the employment of the results of archaeological investigation as a basis for the reconstruction of history, it also serves as evidence for the development of the arts of life, and the progress of human invention. Here again it is naturally brought into relation with the evidence furnished by the practices of the modern savage. Much of this material can be utilized in instruction in handwork, while in America primitive methods in the devising and making of utensils, tools and implements have been employed in boys' summer camps for purposes of instruction and training in the development of initiative and individuality, with, it is reported, much success. In the rude generalized stone implements of our earliest ancestors we have the very beginnings of human culture. From these it is possible to trace the development of specialization in form and material to the highly differentiated modern tools. In passing from stone to bronze and from bronze to iron, it is possible to follow the early form, as it gradually gives way to that more suitable to the qualities of the material of a higher development. The relation of form, technique and material is also illustrated in the study of the primitive industries of basket-work, weaving and pottery, in which both form and decoration can be seen gradually to break away from the conservative tradition, as for instance in the gradual emancipation of fictile ware from its early basketwork model. The training of hand and eye through handwork can and should attain a greater efficiency by study of the development of design of which the study of primitive art furnishes ample

illustration, while the investigation of survivals of the relations between form, material and decoration, as for instance in the ordinary surroundings of everyday life, afford valuable training for the powers of observation and deduction. In many districts of this country folk-industries still survive; where this is the case, this local industry furnishes a useful adjunct to the handwork training, while serving to illustrate and add vitality to the material collected from other sources.

Of equal importance with handwork in the modern curriculum is the development of the idea of citizenship and a grasp of the complexities of modern industrial civilization—fundamental ideas in economics and political science. It has already been shown how forms of primitive culture may be made to subserve the interests of handwork. On another side it is of equal importance in tracing the growth and development of industrialism. Modern civilization has grown by a process of building up out of the simple necessities of man's life. To shield himself from the rigours of climate and weather primitive man clothes himself with skins and vegetable products, at first little, if at all, altered by special preparation from their natural



FIG 3

Knife with Stone Blade, Swiss Lake Dwelling.

state. From the use of these simple materials have developed the arts of spinning and weaving, which lie at the root of so many modern industries; and from the simple lean-to shelter or wind-screen has developed the modern house by stages which can be followed in the culture of the different peoples of the world. By similar stages of progressive development, the modern ship can be traced back to the bundle of reeds or the trunk of a tree. In his endeavour to ensure his food supply man has passed from the precarious stage of hunting, fishing and trapping to the domestication of animals; from the casual plucking of fruits and herbs to the cultivation of the ground and to agriculture. In the beginning, primitive man is able to supply all his needs by his own efforts, but with the possibility of obtaining and storing a surplus of food beyond his immediate requirements, there arises wealth, which in turn promotes specialization. The exchange of different forms of wealth, *i.e.*, commodities, one for another, leads to the conception of the exchange of wealth for service. Any man who shows skill or special adaptability for any one activity tends to become a specialist who, in return for his services, or his products, receives food, clothing and the other necessities of life, this finally giving rise to specialized industrial occupations. The exchange of commodities by barter, with its obvious inconvenience and occasional injustices and difficulties of adjustment, leads

to the device of a medium of exchange—a currency; while the growth of commerce leads to the organization of transport—to the individual a negligible matter, except among migrant pastoral tribes, until the exchange of bulky commodities makes development of the means of transport imperative.

On the other hand, the development of a civic consciousness can be demonstrated from its earliest beginnings. It can be followed step by step, in the various types of social organization, from the simplest, in which a man is born, marries and dies as a member of a small group formed of his immediate kin, to the more complex, in which he and his kin form a part of a larger whole, whether horde, clan, tribe or group of tribes forming a people or nation. In the more simple forms it is possible to segregate the motives which have led to the formation of the social organism. It can be shown how these, as social rights and duties, persist in essentials in some instances, grow and are developed in others, until they assume their final shape in the modern state in which the citizen claims to live his own life, within limits, and to have a voice in the government, while obeying the laws of morality and order which it is the duty of the State to enforce for the benefit of the whole.

As a rational being, man stands in a double relation to his environment. His reaction to the material side results, as shown, in the development of the arts of life, while in his reaction to the immaterial he endeavours to explain the underlying forces which he conceives as the causes of the phenomena of nature with which he comes into contact in his daily life. He evolves on the one hand a system of primitive science which is embodied in aetiological legends and folk-lore, on the other a system of magical and religious belief and practice by which he seeks to control or propitiate the forces of the universe. Religion is the keystone of primitive life, it pervades every activity of the savage. It is only through knowledge of his religious beliefs that it is possible to gain insight into the mentality of primitive man, in whose crude rituals and magical practices the comparative study of religion finds the germs of the greatest force in history. The extent to which the history of religious belief and of the great religious systems of the world can be introduced into the curriculum must vary with circumstances, but it is a subject essential for, at any rate, the more advanced study of the Bible.

In conclusion, from what has already been said, it will appear that the method of cultural anthropology is very largely psychological. It follows that in its relation to the curriculum of the school, while providing valuable material of direct use in certain subjects of instruction, its more important contribution lies in the method and point of view that some knowledge of anthropological subject matter places at the service of the teacher. It broadens the point of view and deepens interest, by laying stress on the close relation of cause and effect in the development of the human mind and human civilization, while it may be used directly to train the powers of observation, to stimulate the intelligence and to develop initiative and individuality.

E. N. F.

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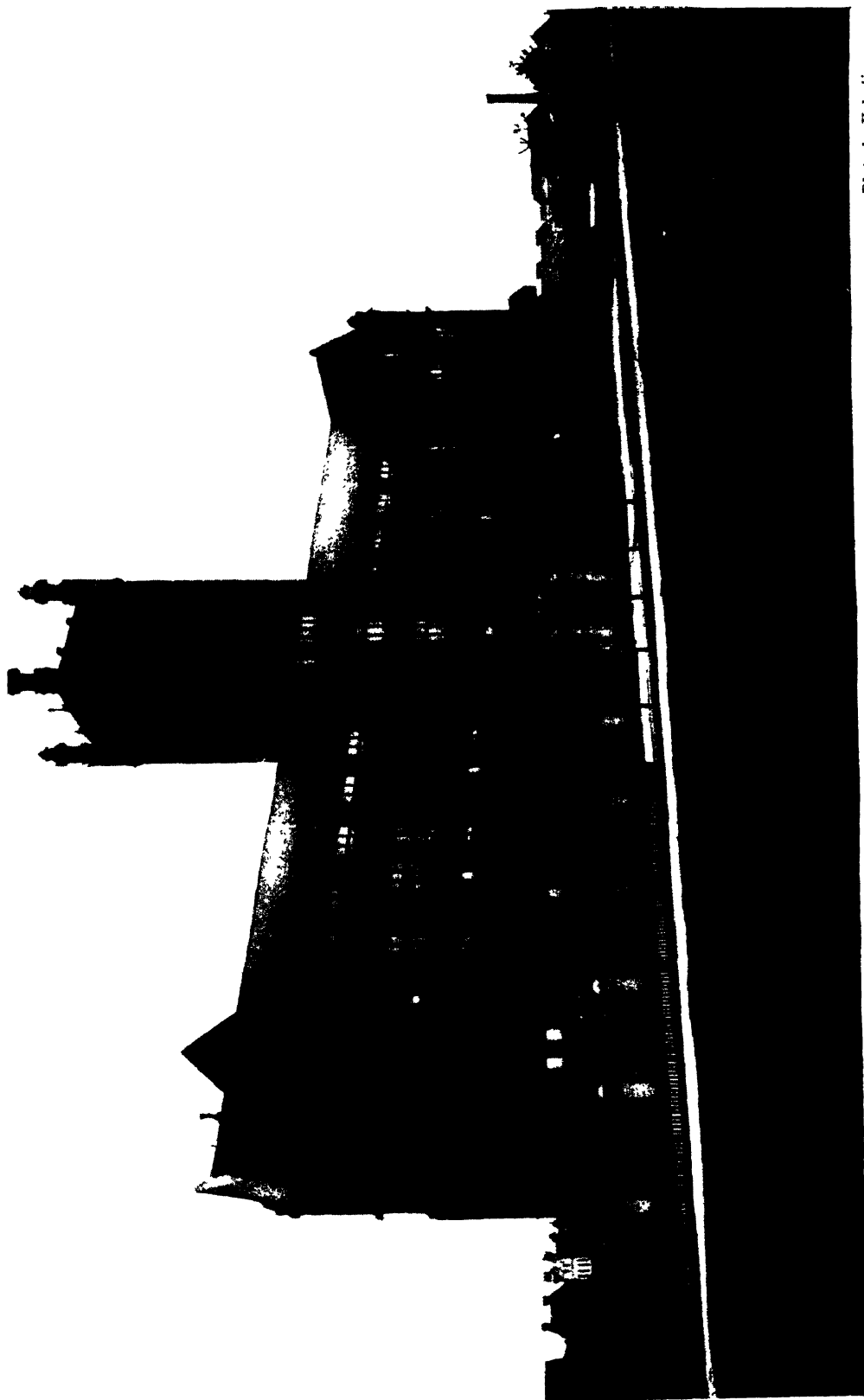
ANTIOCH, SCHOOL OF.—This was founded in pagan times about three centuries before the Christian era. In early times, the children of Christians were sent to such schools for ordinary education; and in the fourth century A.D. the School of Antioch had a high reputation for the value which it set upon pagan literature, though by that time some of its teachers were Christians. Under Diodorus, the school became celebrated for its Christian teaching, and among his pupils were Chrysostom and Theodore of Mopsuestia. After the death of Diodorus, the reputation of the school appears to have come to an end (A.D. 431).

ANTIQUARIES, THE SOCIETY OF.—There was a Society of Antiquaries as early as the reign of Queen Elizabeth, and its foundation is fixed at about the year 1572. In 1589, Elizabeth was petitioned to grant a Charter of Incorporation for "An Academy for the Studye of Antiquity and History," under a President, two Librarians, and a number of Fellows. The library was to be called "The Library of Queen Elizabeth," and was furnished with scarce books, original charters, and rare manuscripts. The members were to meet in the Savoy or in the dissolved Priory of St. John of Jerusalem. It is not known whether the Charter was ever granted by the Queen; but James I dissolved the Society, probably in 1604, and it was not revived till about a hundred years later. To the Society we owe the preservation of many valuable monuments in this country. The members brought specimens of coins, medals, seals, cameos, deeds, and MSS., to be examined and discussed at the meetings. The members at first were limited to 100, and the meetings held at the *Mitre* tavern in Fleet Street, London; but, after the Charter of Incorporation was obtained in 1751, the Society met in Chancery Lane.

The proceedings of the Society, with the papers read at the meetings, have been published yearly from 1770. The papers are contained in yearly volumes named *Archæologia* or *Miscellaneous Tracts relating to Antiquity*. Such subjects as the following have been dealt with: "The Antiquity and Use of Beacons in England"; "The Antiquities of the two Ancient Ports of Richborough and Sandwich"; "A Dissertation on the Antiquity of Brick Buildings in England"; "A Copy of a Deed in Latin and Saxon, by Odo, Bishop of Bayeux." The same kind of research is still carried on.

The Society's rooms are now at Burlington House, London, W.1.

ANTIQUITIES, IN TEACHING, USE OF.—(See EXCAVATION AND EDUCATION.)



Armstrong College, Newcastle-on-Tyne

Photo by Valentine

ANTITOXIN.—A substance elaborated by the body to counteract the toxins of bacteria. The inoculation of an animal with a small quantity of toxin causes the generation in its blood of antitoxin to counteract the poison. The animal thus becomes immune, and from its blood can be drawn the serum used for injection into the human system.

APATHY.—Activity is natural to healthy children, and the apathetic temperament is one of the most hopeless from a teacher's point of view. Some children are apathetic by nature, combining sluggishness of mind with a low moral tone; mentally and bodily there is a want of vital energy, and the nature is so abnormal as to be really defective. Such a nature may be modified by a change of conditions and environment. Children who are apathetic only in school, being vigorous at other times, profit little by their school life, which is successful only when it calls forth energy. If the apparently healthy child is apathetic both in lessons and in play, a medical man should be consulted.

APHASIA.—This is the loss or impairment of speech due to destruction of the areas of the cerebral cortex, or the nerve fibres going to such areas as are concerned with the memories of speech-signs—spoken or written. These areas lie symmetrically disposed in both cerebral hemispheres; but in the ordinary right-handed person, only those in the left hemisphere function. Speech may be lost or never acquired owing to want of activity of the higher intellectual functions (*e.g.*, in idiocy, or owing to defects of the peripheral mechanism of speech)—neither of these types of speech deficiency is included in the definition of aphasia.

Like all voluntary acts, speech is sensori-motor in character. The sensory impressions are received mainly through the eye and the ear. The muscles involved include those of the larynx, pharynx, palate, tongue, mouth, jaws, the muscles of respiration, and (in writing) the muscles of the hand and forearm. Many of the muscle-groups mentioned are actively concerned in the fundamental movements of the newly-born child (*e.g.*, respiration, sucking, crying, etc.), and for these purposes are in accurate co-ordinated activity at the time of birth. For the production of speech, however, this musculature requires a fresh grouping under an entirely separate set of nerve centres. The more primitive acts of respiration, etc., are controlled by centres situated in the medulla and pons. The higher (cerebral) motor and sensory centres of speech are at birth not linked up, but the rapid growth of the brain with the lengthening of the neurones ere long connects these centres both with each other and more fully also with their peripheral counterparts, and the complete sensori-motor speech mechanism is then ready for education. The first external evidence of this is the imitation by the infant of heard sounds. The group of muscular movements above referred to as necessary for articulation, along with the cortical nerve centres immediately controlling them, constitute the *primary speech mechanism*. These nerve centres lie in the cerebral convolutions in front of the lower part of the fissure of Rolando, and act bilaterally. They act directly under the control of Broca's centre, which lies in the posterior part of the inferior frontal convolution, and in the adjacent part of the precentral convolution and of the insula. In Broca's centre are stored the

memories of the motor acts of speech. All of these centres (including those necessary for the movements of writing) are subservient to the auditory and visual word-memory centres—the former controlling primarily vocal speech and the latter the centres concerned with the production of written speech. It is, then, by lesions interfering with Broca's centre, or the auditory or the visual speech memory centres, that aphasia is caused.

Before discussing the various types of aphasia, it should be realized that the earliest intelligible vocal efforts have their origin in auditory word memories. The child reproduces what has been imprinted upon its auditory word-memory centre—thus local accents are faithfully reproduced. Further, the education of the visual memory centre is only possible by the correlation of written or printed signs with auditory memories. The auditory speech centre, therefore, acts as the instructor of the visual speech centre. Lastly, all the speech centres act under the control of the higher ideational or intellectual centres towards the vocal or written expression of the individual's thoughts and will.

Auditory Aphasia (WORD-DEAFNESS). The memories of the sounds of words are stored in the auditory speech centre. The latter occupies the first and, probably, part of the second temporal convolutions on the left side of the brain. The receptive auditory centres of both sides transmit their impressions to this centre.

(a) *Subcortical or Pure Auditory Aphasia.* In this form of aphasia, the fibres passing to the auditory speech centre are destroyed; the centre itself is intact. Word memories remain and spontaneous speech is perfect. Spoken speech is not understood, and repetition and dictation cannot be carried out. Communications can only be received by reading.

(b) *Cortical Auditory Aphasia.* The lesion in this case has destroyed the actual centre. Auditory speech memories are lost and the motor speech centre is no longer under control. Internal speech and thought are impaired; hence mistakes are made in spoken speech, reading aloud, and in writing. Words and syllables are nuxed up in talking without the aphasic recognizing his mistakes, thus differentiating this from motor aphasia, in which such errors are appreciated by the individual. In time, the right auditory speech centre takes on function, so that (b) rarely persists completely.

Visual Aphasia (ALEXIA OR WORD-BLINDNESS). The visual speech centre in which are retained the memories of written or printed speech lies in the left angular and supramarginal convolutions. In visual aphasia letters and words are seen, but not understood. As in all aphasias, the symptoms vary in intensity with the severity of the lesion.

(a) *Subcortical or Pure Word-Blindness.* The nerve fibres passing to the centre are destroyed. Printed or written words are not understood. The aphasic can write spontaneously or from dictation, but cannot read what he writes.

(b) *Cortical Word-Blindness.* The centre is itself destroyed. Memories of printed or written words are lost. This type of aphasic cannot read, write spontaneously or from dictation, nor can he copy. The ability to write is not generally believed to depend on any special writing centre—most probably it is effected by a special control of the arm and hand motor centres by Broca's centre, which system is, in its turn, directed by the visual speech centre. Loss of this direction is what causes loss of power

of writing. Inability to write is known as *agraphia*. *Paragraphia* is partial interference with writing—in it wrong words or syllables or letters are written.

Motor Aphasia. This is caused by lesion of Broca's convolution. The motor aphasic may be quite dumb, or he may be able to utter a few ordinary words and phrases. The latter is possibly due to activity of the area corresponding to Broca's convolution on the right side of the brain.

(a) *Subcortical or Pure Motor Aphasia*—due to destruction of the fibres passing from Broca's centre to the primary speech mechanism. Uttered speech is lost, whether spontaneous reading aloud or repetition. Writing is retained unless the hand motor centres are injured or their control impaired.

(b) *Cortical Motor Aphasia.* Here Broca's convolution is destroyed. All the phenomena of motor aphasia already mentioned are present. In addition, there is impairment of internal thought and speech—complicated sentences are understood with difficulty. All mental word-pictures are rather blurred.

In relation to all aphasias, Marie has denied special functions to Broca's centre, and says that all aphasias are really sensory in character and arise from lesions in the Wernicke Zone—part of the temporo-parietal region—but the main weight of opinion is expressed in the views which have been given.

The tests to determine the presence of any type of aphasia are sufficiently indicated by the defects which have been outlined. Aphasias, however, are seldom pure, two or more types being combined.

R. V. C.

APHEMIA.—Another name for aphrasia (*q.v.*).

APHONIA.—A general term for the loss of the power to produce sounds required in the utterance of speech. It may result from disease of the vocal organs, paralysis, or inflammation. A severe cold produces a species of aphonia.

APHRASIA.—A form of aphasia, denoting the inability to combine a sensation of sound with the corresponding muscular process necessary to articulate the same sound. This inability may be accompanied by perfect hearing and understanding of speech. In some cases, the disorder deprives the individual of the power of combining words into phrases and sentences.

APOLLONIUS OF PERGA (about 240 B.C.).—He was a mathematician.

APOLLONIUS OF RHODES (about 240 B.C.).—A writer of poems and works on grammar.

APOLLONIUS OF TYANA (born 3 B.C.).—A great traveller and neo-Pythagorean teacher at Ephesus.

APOTHECARIES, THE SOCIETY OF.—At first, an apothecary (Greek, *apothēke*, a storehouse) was a keeper of a general store (*e.g.*, a grocer); but, later, of a drug store. It was not until the reign of James I that the apothecary became separated from the keeper of the general store.

In 1617, the Society of Apothecaries was incorporated by Royal Charter, and from that date an apothecary became a licentiate (*i.e.*, a licensed

person) of the Society of Apothecaries, but the term has long gone out of use. The apothecary sold medicines and made up prescriptions, as is also done by a chemist and druggist; and he also was entitled to attend sick persons.

In 1815 an Act of Parliament declared that no person should practise as an apothecary, or as an apothecary's assistant, unless he had been certified by a competent body of examiners. A penalty of £20 might be inflicted on any uncertified person who practised, and no such person could recover his charges in a court of law.

In 1874, power was given to the Society of Apothecaries to examine and to grant licences, as other medical bodies had done since 1815.

The Society of Apothecaries holds an examination every three months for a certificate of qualification to compound and dispense medicines.

The examination consists of two parts—

(a) **PRACTICAL.** The Compounding and Dispensing of Medicines.

(b) **ORAL.** Chemistry, Materia Medica and Pharmacy, the Translation of Prescriptions.

The Society also awards a Diploma in Medicine, Surgery, and Midwifery. This diploma is registrable under the Medical Act of 1886, and qualifies the holder to compete for appointments in the Naval, Military and Indian Medical Services, and for Civil, Colonial, and Poor Law appointments. The examinations for the diploma cover a course of five years, and candidates must complete a prescribed curriculum in a medical school.

The Apothecaries' Hall and the examination offices are at Water Lane, London E.C.4.

APPARATUS, DIDACTIC.—(See MONTESSORI SYSTEM IN ENGLISH-SPEAKING SCHOOLS, THE.)

APPARATUS, HOME-MADE.—Home-made apparatus embraces articles made either at school or at home, in substitution for the more highly-finished and costly articles listed by manufacturers; any apparatus that is not obtainable in the ordinary way, or that is required for some immediate use; and apparatus constructed by teachers and scholars in illustration of some particular facts or principles, and undertaken with a view to the formative educational value arising out of such work. The materials utilized in home-made apparatus are usually simple and inexpensive, and such as are to be found in the spare stores, cellars, laboratories or workshops of nearly every school. The supply of materials available for any given project is often to be found supplemented in surprising degree by choosing from amongst items voluntarily brought by scholars whenever a requirement is made known. As a rule, a measure of care should be exercised that any work undertaken is tolerably well finished; but it is clearly of far greater importance that the article, whatever its nature, should be able to function correctly. Efficiency first, and appearance afterwards, and as good an appearance as possible, should be constant aims in the construction of home-made apparatus.

An Aquarium. For the purpose of this section a number of typical examples of home-made apparatus is given. These sufficiently illustrate the nature of the principles, materials, and expedients that have been, or may be, adopted in good applications of such work. A small and simply-made school aquarium (Fig. 1) may be 18 ins. long, by 9 ins. wide, by 10 ins. deep. If this is

the size determined upon for the glass tank, a good flat base-board, sufficiently long and wide to protrude half-an-inch beyond the glass on every side, and 1 in. thick, should be procured. Yellow deal is suitable for this purpose. When planed, the positions to be occupied by the lower edges of the glass should be marked out. Grooves to receive the glass may then be made with a saw as shown in Fig. 2; and the corner pieces cut away

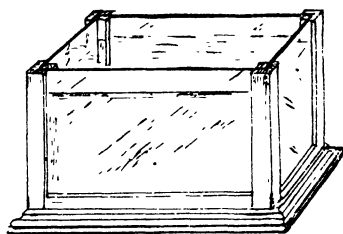
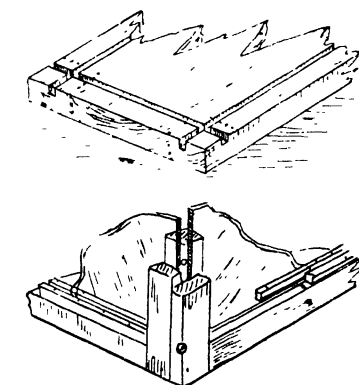


FIG. 1.
Aquarium.

to receive the posts, as shown in Fig. 2 and Fig. 3. The inner post, which is 1 in. square, should be very securely fastened to the base by long, fine screws — 2 in. long and size No. 8 are suitable. White-



FIGS. 2 and 3.
Parts for Aquarium.

lead should be used freely wherever the surfaces of wood, or of wood and glass, glass and metal, or wood and metal come together in the construction of any water-holding apparatus. The outside surfaces of the inner post should exactly coincide with the inner edges of the grooves for the glass. The outer pieces of wood that make up the corner posts should next be nailed together. Wire brads, $1\frac{1}{2}$ in. long, are suitable nails to use. The outer part of the posts in each case consists of two pieces, $1\frac{1}{2}$ in. wide, and 1 in. wide respectively. Both are $\frac{1}{2}$ in. thick, and fit together as shown in Fig. 3. When the glass is in position, the outer parts of each are joined to the inner square post by means of long, fine screws inserted diagonally, as shown in Fig. 3. The glass used may be ordinary window glass, of the thickness known as 21 oz. (i.e., 21 oz. per sq. ft). The glass should be thoroughly cleaned, and all grooves to receive it well filled with white-lead pressed in, before it is finally fixed in position. According to the thickness of the glass used, a small unfilled space will be found at the bottom of the posts—between the outer and inner. This should be carefully fitted with a thin flat slip of wood, well smeared with white-lead before being inserted. The bottoms of the outer posts may then be nailed to the inner posts and base. A piece of ornamental moulding mitred around the base will give a satisfactory finish to the work. There is an alternative method of connecting the glass with the base of the aquarium, where instead of grooves, the glass

is secured, and the tank made watertight, by means of two square slips of wood nailed to the base. (See right-hand side of Fig. 3.) An alternative method of making the posts is also shown in Fig. 4 and Fig. 5. Parallel strips of zinc $1\frac{1}{2}$ in. wide, and slightly longer than the tank is deep, are evenly folded to receive the glass by being placed over a groove in any piece of hard wood or iron. A straight piece of iron

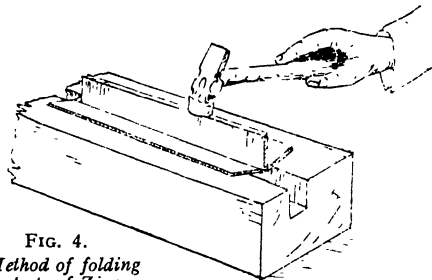


FIG. 4.
*Method of folding
strip of Zinc.*

(hoop-iron) is placed on the zinc strip, and struck with a hammer until the desired fold is obtained. Two such pieces are then securely soldered together to make one corner post, as shown in Fig. 5. The zinc should not be of less thickness than No. 22 gauge. The whole of the woodwork inside the aquarium should be well painted with white-lead paint, and then coated with a couple of coats of spirit varnish, or copal varnish. Wherever the white-lead joints occur on the inside, they should be thoroughly covered with varnish to preclude the possibility of poisoning or otherwise harming

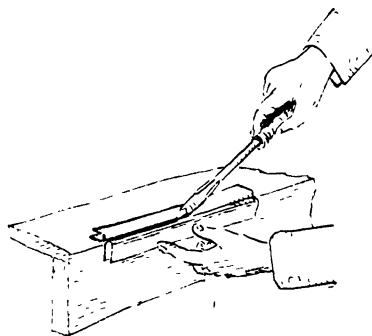


FIG. 5.
Method of Soldering.

the more delicate forms of life that the aquarium may be intended to contain.

An Observation Box. Caterpillars, beetles, stick-insects, and other subjects that may be required for systematic study over a short period only, may be kept in an inverted glass jar resting in a bowl, as shown in Fig. 6. An observation box of more elaborate pattern is seen at Fig. 7. It is easily made by scholars who have access to an ordinary woodwork room. In this box molluscs, toads, and other reptiles may be kept with safety. A glass front slides in grooves similar to those shown in Fig. 2 and Fig. 3, and is locked in position by suitable "buttons" fixed at the ends. A perforated zinc panel is fixed in the top of the box for ventilation. At each end a hole is bored, and the holes are provided with small perforated

zinc covers, details of which are given in Fig. 8. These small portholes enable a pointer to be introduced, by means of which the object being

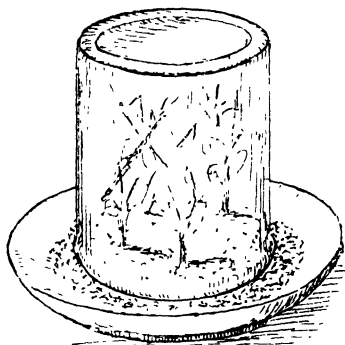


FIG. 6.

Observation Box.

studied may be moved to a new position, or special features indicated, with safety.

Other Hutches and Display Cases. A rabbit, tortoise, or guinea-pig hutch is quickly made from any available packing case. Four pieces of wood, 2 in. to 3 in. wide, and from $\frac{1}{2}$ in. to 1 in. thick, nailed

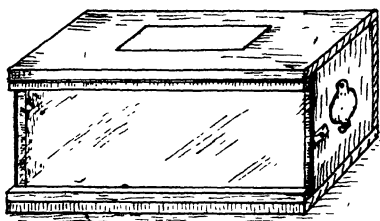


FIG. 7.

Observation Box.

or screwed together at the corners, overlapping or butt-jointed, serve to make an effective door when covered with wire netting. The door may be hinged with two leather hinges cut from any old pieces of stout leather. The fastenings may consist of two wire hooks attached with round headed screws near the bottom. (See Fig. 9.) Other types of easily made hinges are shown at Figs. 10, 11, and 12.



FIG. 8.

A box for dry specimens: minerals, seeds, fruits, eggs, butterflies and coleoptera is shown in Fig. 13. To make this type of box a number of parallel strips are cut off, exactly equal in length, for the ends and partitions. Two long pieces are required for the sides, which are nailed against the ends of the partitions, etc. The side-pieces should be $\frac{1}{2}$ in. wider (deeper) than the ends; and, along the top edge of each side, a $\frac{3}{4}$ in. square lath of wood should be nailed. This serves to keep the glass top in position, and ensures that it slides evenly over the tops of the ends and partition-pieces. (See Fig. 14.) The bottom is made of stout cardboard, glued and tacked in position. Cross partitions may be made by cutting out

rectangular pieces of cardboard, as shown in Fig. 15; then half-cutting through the card at the dotted lines, bending, and fixing the bent flaps to the long partitions in the positions required. Any number of these cases may be made to pack on top of each other, or, when standing on one of the long sides, they form effective display cases. The glass front prevents misplacement or loss, and permits clear inspection of the contents. Single display cases of a good type may be made as Fig. 16 and Fig. 17. The object is attached to the door at the back, and then fitted into position. This method allows the object to be inspected directly without disturbing its setting. Where many such cases are wanted, small disused negatives supply excellent glass, and require no cutting. Pressed specimens of flowers, and other botanical subjects are effectively mounted by the *passé partout* method. Unwanted half-plate negatives are good for this purpose. A card is cut to the same size as the glass. Cloth or strong paper strips are cut to the length of the respective sides; and when the subject and a descriptive label have been duly

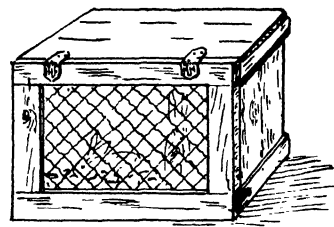
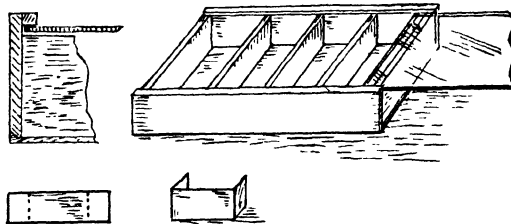


FIG. 9.

Rabbit Hutch.

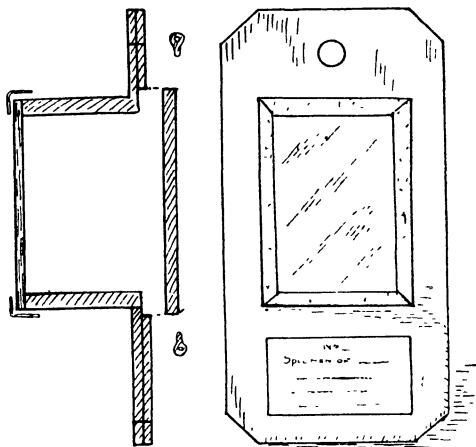
FIGS. 10, 11, and 12
Types of Hinges.

FIGS. 13, 14, and 15.

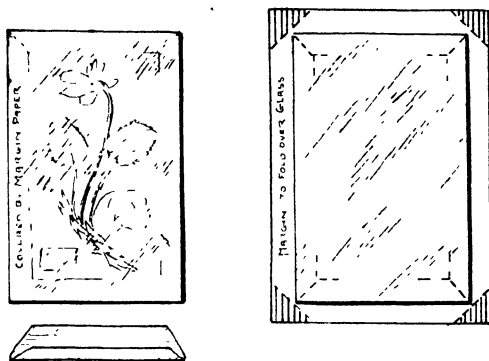
Box for Natural History Specimens.

attached to the card, the glass is placed over the card, and the binding glued to the glass in front and to the card behind. (See Figs. 18 and 19.) Another method of fastening glass and card together is to cut out a rectangle of strong paper or cloth that is $\frac{1}{2}$ in. larger all round than the glass. This is glued to the card behind. The glass is then placed over the card; the shaded corners of the paper cut off as shown, and the projecting margins glued and fastened down to the glass.

Simple Scientific Apparatus. A simple illustration of the properties of light is shown in the home-made periscope (Fig. 20). A full-sized diagram showing the construction is given in Fig. 21.



FIGS. 16 and 17. *Single Display Case.*



FIGS. 18 and 19.
Passe Partout method of Mounting Specimens.

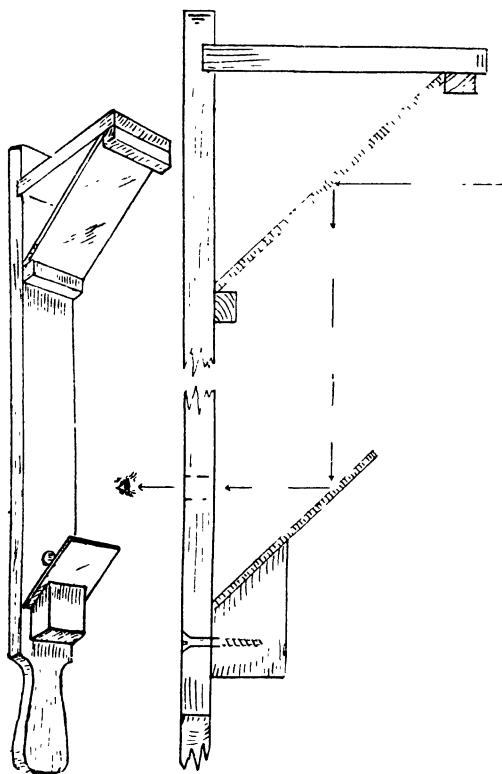


FIG. 20.

FIG. 21. *Periscope.*

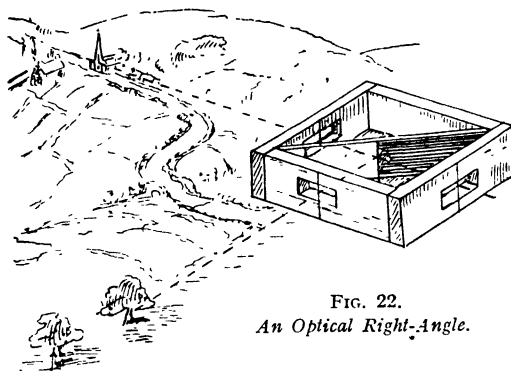


FIG. 22.
An Optical Right-Angle.

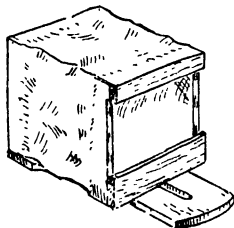


FIG. 23.

Camera.

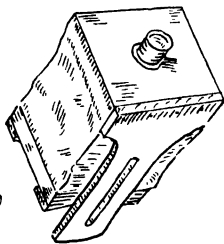


FIG. 24.

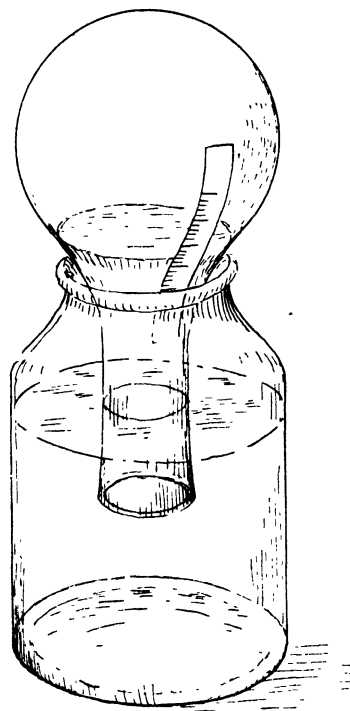


FIG. 25. *Weather Glass*

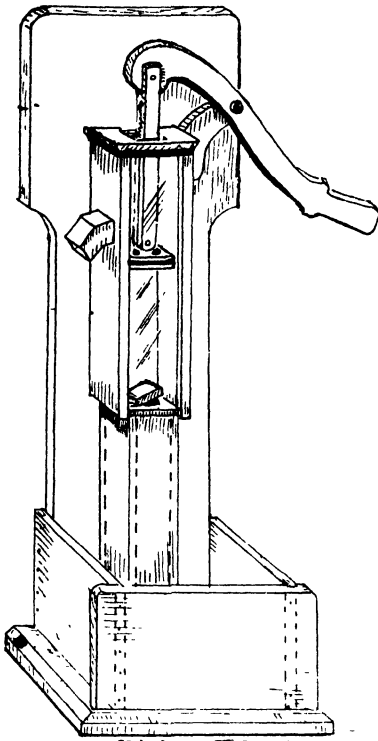
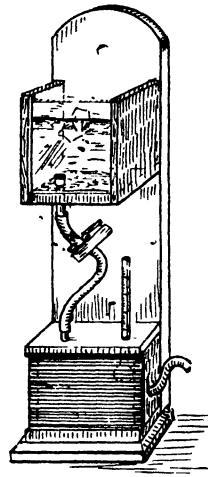
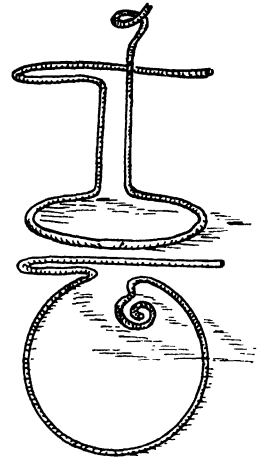


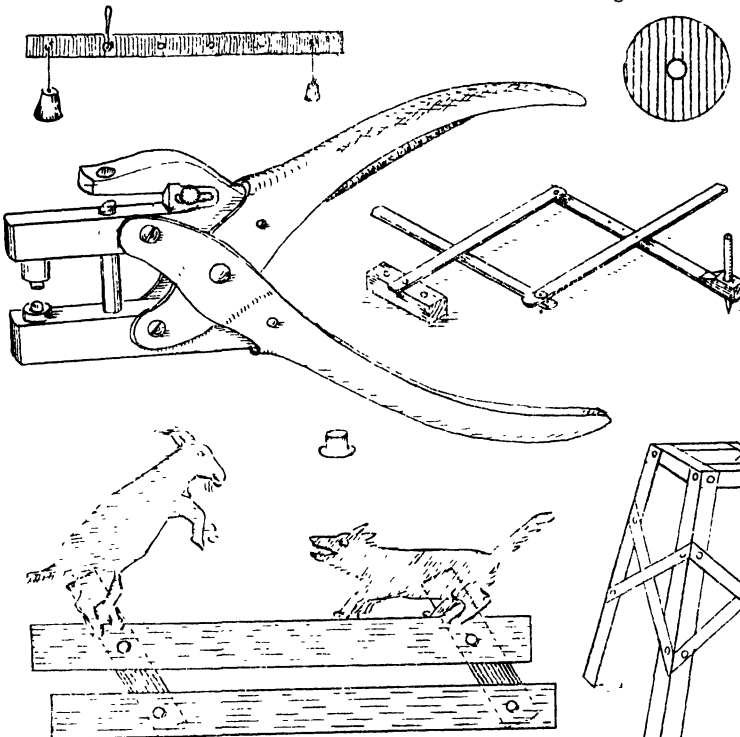
FIG. 26. Pump.

FIG. 27.
Hygrometer.FIGS. 28 and 29.
Wire Flower Holder.

An optical right-angle, in the use and construction of which scholars are always greatly interested, is shown at Fig. 22. A simple camera, the construction of which is sufficiently clearly shown in the drawings, Figs. 23 and 24, is an excellent piece of apparatus for the scholars of an upper school to make. Lenses of any type are brought by scholars, commented upon, and those most suitable selected and fitted. Fine textured black lining cloth in two layers, with red photographic paper between the layers, serves well for bellows. The length of bellows is determined experimentally

when the lens has been fitted in the front, a portable piece of ground-glass being used for focusing the picture.

A "farmer's weather glass" is shown at Fig. 25. Into a wide-mouthed jar, partly filled with water, a long-necked flask (also partly filled with water) is quickly inverted. The weight of the water remaining in the flask causes a partial vacuum to exist in the upper part of the flask. According to the varying pressure of the atmosphere on the face of the water in the large jar, so the surface of the water remaining in the flask rises or falls. A graduated slip of paper glued to



FIGS. 30 to 35. Eyelet Punch and Models made with this tool.

the flask enables a comparative record to be made.

An exceedingly effective apparatus, and one presenting very little difficulty in the making, is a full-size wooden pump (Fig. 26). The glass fronted chamber allows the movement of the various parts to be clearly inspected at every stage. The general construction is clearly shown in the drawing. In the construction of the upper valve a layer of stout sole leather is used to secure watertightness at the sides. Four glass marbles fall into conical holes after each lift and prevent the escape of water downwards. If a suitable return shoot is placed against the outlet, all water returns to the base tank, and the pump may then be worked continuously.

Fig. 27 is an adaptation of Hine's Hygrometer, but is in every respect much better for class demonstration purposes. In this apparatus ice is dissolved in the water contained in the upper glass-fronted tank. The cooling water is then allowed to pass down through the tube and into the lower glass-fronted reservoir. The back of the glass in this tank is painted black. The dew-point is clearly seen on the face of this glass, while the immersed thermometer registers the temperature.

A home-made flower-holder for class use in drawing, painting, modelling, etc., is shown in Fig. 28. A plan is given at Fig. 29. It consists of a ring-like base, the two ends being upturned. One end of the wire is curled to support the flower, and the other is provided with a long, flat horizontal loop, which is intended to support a white card as a background.

Fig. 30. shows a type of eyelet punch. By the aid of this useful tool quite a large field of constructional work of a light type is thrown open to teachers and children. Primarily intended for use in dealing with paper and leather, it is found to work excellently in sheet material of almost any kind. Small models in sheet zinc demonstrate mechanical principles well; the eyelets form excellent hinges if loosely closed, in toy-making and work of a meccano-like type; while the scope of construction is not limited to set pieces as in the standard apparatus of this character that may be bought. The wide application of this tool is sufficiently indicated by the types of constructional work shown in Figs. 31, 32, 33, 34 and 35.

J. H. D.

APPERCEPTION.—This is the process whereby an object is not merely recognized, but comprehended more fully than ever before. To appreciate this distinction between mere recognition and the higher cognition involved in a more or less complete comprehension of an object, a knowledge of the psychology of *association* and *abstraction* (qq.v.) is a necessary preliminary.

No cognition is possible unless the object presented arouses, by virtue of associations already formed, some traces of past experience. Both the kinds of cognition referred to, therefore, involve the revival of traces of previous experience. To take a simple case, the baby recognizes his rattle at a distance in so far as the visual sensations which he now has can revive traces of the tactual, kinaesthetic and auditory sensations previously enjoyed in dealings with that object. And this revival is possible because these latter sensations, having in past experience occurred in close connection with the visual ones, have become indissolubly associated

with them, and are now partially revived by them. At the same time, there is aroused, also, an impulse to repeat former movements; and the child is seen clutching at the object. Here, then, we have an example of mere recognition, or *perception*, as it is often called. This process takes place with the lower animals, as well as with human beings.

Let us now examine an instance of a more complex cognition (*i.e.*, of *apperception*). Suppose that the same child is now at school, and is asked to draw and paint the rattle. Obviously, when the object is first put before him, it is perceived in a manner similar to that just described, the only difference being that, since much more tactual, kinaesthetic, auditory, and other experience has been obtained with this and other somewhat similar objects, the results of that experience having been "boiled down" into more stable and more readily revivable residues, the process is more unerring; so far, however, it is merely *perception*. But if the child is to draw and paint the object, he must revive and bring to bear on it (still by virtue of associations enabling the results of past experience to be recalled) further psychical elements of a more or less *abstract* nature.

Ideas and Their Relations. What, now, is the nature of these governing ideas? Human beings can single out parts, or aspects, of the concrete wholes which are presented to them in mere perception. They can *compare* objects, retaining or reviving the idea of one while perceiving another, and noticing differences or likenesses between them. In this process they are greatly helped by *language*. Elements thus singled out and associated with words or equivalent signs are called *abstract ideas*. But abstract ideas are more or less connected elements. When, for instance, a human being has observed sufficiently to be able to state unerringly that a given object is exactly square, he has acquired a *system* of abstract ideas (*i.e.*, a number of abstract ideas which are not separate elements, but so intimately related as to form an organized combination); he realizes that a square is a plane, rectilinear figure bounded by four equal lines which meet one another at right angles. All definitions and laws, or general statements, are expressions of such systems of ideas. We may call them *general truths*.

Now, to direct the process of drawing the rattle, the child must bring to bear systems of abstract ideas in the spheres of shape, size, and colour. He must be able not only to *perceive* the object, but to *apperceive* or *observe* it on the lines indicated.

Apperception, Reasoning, and Observation. Apperception is often spoken of as a process of interaction between the *old* and the *new* (*i.e.*, between the ideational furniture or apperceptive systems already elaborated, and capable of being aroused and brought to bear and the object or situation presented). Apperception is involved in all solving of problems, as in each case some object or situation is presented and a requirement is made for further knowledge with regard to it, which can be obtained only by reviving and bringing to bear some of the ideational machinery already possessed. But the solving of problems is usually known as *reasoning*. Hence, reasoning is apperception. If we choose to confine the term *reasoning* to the solving of more complex problems, we can say that reasoning is the highest form of apperception. But if we prefer to extend the meaning of *reasoning* to cover *all* cases in which we use abstract systems of ideas already

possessed to learn more about any particular object or situation, we can say that *reasoning*, *apperception*, and *observation* are synonymous. The same object, however, may be apperceived differently according to the system of ideas aroused on its presentation. Thus, if the accompanying figure be shown to different persons, or the same person at different times, it may be variously comprehended. If the ideas aroused are of plane, rectilinear figures, it may be apperceived as a trapezoid with two sides parallel. If ideas of perspective predominate, it may be taken as a square placed exactly in front of and a little above the level of the eye. If the apperceptive system summed up by the word



"dishes" prevails, the figure may be conceived to represent a straight-sided bowl placed exactly on a level with the eye. Similarly, it might be

taken as a hat, or a boat, or as some other thing.

It is the teacher's business in most lessons to see that objects are similarly apperceived by all the pupils. If this is to be the case, the apperceptive systems must obviously not be allowed to arise casually (*i.e.*, according to the state of each child's mind when the object is presented without any previous preparation). Often the necessary systems must be expressly aroused. Hence the need of careful introductions to many lessons, and of precision in the framing of questions and in the setting of problems. The teacher, for instance, who, without any qualification, asks, "What do you notice about that?" is opening the door to a host of mental visitors who may easily bring chaos instead of harmony into the lesson. B. D.

APPERCEPTIVE MASSES.—(See HERBART.)

APPLICATION.—To apply knowledge is to put it into practice, so as to combine *knowing* with *doing*. The aim of Herbart (*q.v.*) and his followers has been to produce reflective thought in the pupil, and they have stated, as the formal basis of lessons intended to produce reflective thought, five steps, *viz.*, preparation, presentation, association, generalization, and application. Application is included by Herbart in the term "method," and his followers treat it as the final stage in the development of a lesson. The great extension of late years in the use of activity in learning has brought application into a more prominent place. Kindergarten, manual training, nature study, drawing, and the facts of simple science are now taught very largely for the training they afford in application of ideas. Where application of ideas is an essential part of the teaching process, the pupil learns ideas in association with others in a suitable order; interest is increased by combining doing with thinking; and facts are more firmly and correctly impressed upon the mind than by mere verbal learning.

APPLICATION.—(See FIVE FORMAL LESSON-STEPS, *THE*.)

APPLIED GEOGRAPHY.—(See GEOGRAPHY (COMMERCIAL), *THE* TEACHING OF

APPOINTMENTS IN PUBLIC SERVICES.—(See HIGHER PUBLIC SERVICES, *EDUCATION* FOR *THE*.)

APPRECIATIONS.—(See PERSPECTIVES, APPRECIATIONS, AND ATTITUDES.)

APPRENTICESHIP SYSTEM, THE EDUCATIONAL ASPECT OF.—Apprenticeship has played an immense part in the education of the English child. For three centuries, when schools were rare and available for the minority alone, it provided, especially for the industrial classes, not technical instruction in a trade only, but education in the wide sense of the term; in fact, general training, the formation of character, preparation for life.

We must dismiss altogether from our minds apprenticeship as we know it to-day. At its best, it is merely a method of technical training; frequently the so-called apprentice is indistinguishable from the learner, improver, and juvenile employee.

It is also necessary to realize the industrial organization of England in the days when apprenticeship flourished. The domestic system of industry then pertained; all trades were carried on by handicraftsmen, who were, or could become, their own masters, working with their own capital and tools in their own homes: it was not until the capitalization of trade and industry, and the adoption of machinery worked by power in the eighteenth century, that independent craftsmen were replaced by employees and capitalist employers. In many towns these independent craftsmen organized themselves into trade societies, called guilds; thus united, they obtained charters from town and Crown, made by-laws for the regulation of their trade, and elected officers to enforce them. The advantages of union were obvious in days when the rights of citizens against overlords and the Crown, legal procedure and safety of travel were not fully established; by 1300, towns of any importance had their guilds, and the practice spread wherever a little body of craftsmen collected. It was in an England thus industrially organized that apprenticeship struck its roots.

At first, apprenticeship was a private arrangement between father and master, the one desiring for his son the technical skill which would win him admittance to the close association of craftsmen, the guilds; the other, glad to give instruction and maintenance in return for labour that received no wage. But, from 1300 onwards, the guilds gradually assumed control. As regulators of industrial conditions, they necessarily took cognizance of apprenticeship when it became more general. Moreover, it served their own purposes, namely, the maintenance of good work and, less creditable, the preservation of members' privileges and the limitation of competition. Consequently, they systematized the custom, adopting apprenticeship and making it the one channel, save in exceptional cases, by which a lad could obtain guild membership, without which the guilds would not permit him to practise a handicraft. Apprenticeship now became the normal training for the industrial-class boy, whose natural career lay in a trade.

With the guilds' assumption of control, dating variously in different localities, but accomplished between 1300 and 1450, apprenticeship became a semi-public institution. Resting on the by-laws of various guilds, inevitably it varied in different towns and trades, but the practice of London set a standard; and by 1450 certain main features were common to apprenticeship throughout the country. Some of the regulations relating to

apprentices are clearly prompted by the self-interest of guildsmen; but, after all, guildsmen were fathers, or potential fathers, and the rules reveal their makers' solicitude for the welfare of the apprentice. Their first object was sound technical instruction; only competent men might take apprentices, and they had to produce their indentures, or agreements, at the guild court to show that all was in order; a compulsory term was adopted, seven years' service being required by most guilds, as this ensured the apprentice's thorough training and the master's recompense, by the boy's labour, for instruction and maintenance. But the guildsmen expected apprenticeship to give more than technical training. It was the training which their sons would undergo; it must be a general training for life. This, the non-technical side of apprenticeship, is never disregarded. The guilds insisted that apprentices should reside with their masters, thus being throughout their apprenticeship under supervision and control; they were to be maintained, but not to receive wages nor enjoy the independence which wages bestow. The master must be not merely a good craftsman, but a responsible man, married and a householder, not a "dweller in chambres and uppon staires"; for the bachelor, however skilful, could not give the apprentice that home-life and parental control which the guildsmen thought necessary. The master was held responsible for his apprentice's good conduct; he might not allow him to "haunt taverns," "make anie sett bankett," nor play "giddye yaddye and footeball." In addition to such or similar by-laws, the supervision of the guilds' officers further ensured the careful training of apprentices. The standard of care considered necessary by the guilds was that which a good father would render his son; masters were expected to give their apprentices religious instruction, and that general moral and social training which would fit them for future life and good citizenship.

Such training, technical and general, was continued throughout the years of adolescence. To-day the working-class child upon leaving school at thirteen or fourteen years old is very much his own master; as an earner of wages he possesses a large measure of freedom from parental control. Until recently, it was usually only the children of the well-to-do whose education, whether by books or in the general sense, was continued through the years of adolescence. But the apprentices of the fifteenth, and, as we shall see, the sixteenth and seventeenth centuries, were bound generally at the age of 14, and were prohibited by guild, and, later, by statute law, from ending their "terms" and working independently before the age of 21.

The Government and the Guilds. In 1562 the Government adopted the apprenticeship system of the guilds, even as the guilds had adopted the private practice of individuals. The Statute of Artificers, passed in that year for various political and social-economic reasons, made a seven years' apprenticeship compulsory for any one desiring to practise a trade. Thus apprenticeship became a national institution. The Act, though a landmark in the history of apprenticeship, made little change in its customs. The Crown had no adequate machinery with which to enforce the Act, and consequently relied mainly upon the guilds for the administration of the apprenticeship clauses. All, therefore, save during the economic disturbances occasioned by the Civil War, went on

practically as before during the next hundred years; the guilds being backed by the Crown, their regulation of trade still unresented, and, consequently, still possessing power to enforce their rules. Such changes as set in owing to economic or political developments did not affect the educational aspects of apprenticeship; and the indoor-system, with all its care for general training, continued along the original lines right up to 1700, remaining still primarily a method of technical instruction, and secondarily, but recognizedly, a method of general education. In connection with this its latter aspect, it is interesting to observe that during the Civil War a larger proportion than usual of boys apprenticed were fatherless lads. Yet industry was disorganized, and it was not a propitious moment to start on a career. It may be suggested that it was the non-technical side of apprenticeship which appealed to anxious guardians and mothers. Of later apprenticeship, it has to be added that instruction in reading and writing was sometimes stipulated for by parents from the close of the seventeenth century onwards. About 1715 stipulations that boys are to be allowed to attend "ye writing school" are fairly frequent in Sheffield, and similar memoranda are added to the customary clauses of the indentures in other parts of the country. But, on the whole, this is rare.

We have spoken generally of apprentices as being boys of the industrial class, but apprenticeship was utilized for the training of other children also. The sons of husbandmen were apprenticed, but the Statute of Artificers and many guilds opposed such advance in life, and the guild registers reveal that only a small number of husbandmen's sons were apprenticed. Yeomen's and gentlemen's sons were apprenticed in larger numbers, generally to merchants or the wealthier tradesmen. In a good trade lay a lucrative career even for well-to-do boys, yet, in their case also, the general training given by apprenticeship was probably a consideration in their binding, for a fair number were fatherless lads; while high premiums were often paid to their masters in the late seventeenth and the eighteenth centuries, partly, no doubt, because masters in the lucrative trades could demand their fee, but probably in part to win the boys' entry into good homes. There was another class of apprentice in whose binding the general training and maintenance afforded by apprenticeship were the main considerations. The Justices of the Peace were empowered by various statutes to apprentice pauper children, and numbers were apprenticed from 1562 right on through the eighteenth century. No doubt where the master was a craftsman he taught his trade to the boys, but in the case of girls it is often expressly stated that they are to be trained only in matters "pertaining to a maid-servant," while the boys were frequently placed with men who had no trade to teach. Girls of the industrial class were apprenticed, but only an insignificant number as compared with that of the boys. Women were heavily occupied in housework, which then often included baking, brewing, weaving, and other occupations now specialized. Moreover, craftsmen were permitted to employ wives and daughters to help, though unapprenticed, in their craft. Consequently, few daughters were apprenticed. In the case of that few, it is clear that general training was often the object. As for pauper girls, they were apprenticed in as large numbers as pauper boys, and for the same motives.

The apprenticeship system had its faults; careless or harsh masters were not always checked by the guilds: even well-cared-for apprentices worked long hours; while guild rules, such as those against football, reveal a disregard for what we consider the natural right of the young to recreation. It had, too, its limitations. Even when the guilds had power rigorously to enforce the system, there was some evasion; moreover, at all times, it was only a certain, though a considerable, number of boys and girls who received the double advantages its training afforded. Nevertheless, the apprenticeship system of the fifteenth, sixteenth, and seventeenth centuries not only stands in immeasurably favourable contrast to the *laissez faire* system of the late eighteenth century, with its callous exploitation of juvenile labour and disregard for moral and physical well-being; it compares, too, quite favourably with our educational methods to-day. Its revival is, however, impossible; the old apprenticeship system is out-of-date.

Its dissolution began in the early eighteenth century and, though it was maintained satisfactorily in many localities and trades until 1750, and even later, its disappearance was only a question of time. It broke down partly because it was so interwoven with the guilds' monopolistic restrictions upon trade and industry, which were hampering and impracticable under the new economic conditions engendered by the commercial and industrial expansion of the eighteenth century. When men refused to tolerate, and the Crown would no longer support, guild control, there was no power to enforce apprenticeship. Fathers became unwilling to postpone their sons' power of wage-earning when unapprenticed men, flouting guild rules, entered trades at their pleasure; masters began to resent the burdens of tutelage; moreover, the increasing size of workshops rendered the housing of apprentices impracticable. Further, with the increasing sub-division of processes and adoption of machinery, a seven years' technical training for every one, in every trade, was obviously unnecessary. Apprenticeship began to be discarded; even where maintained, the indoor-system was gradually superseded by the outdoor, apprentices living at home and receiving small wages; such apprenticeship possessed technical, but not general, educational value. In 1814 Parliament abolished compulsory apprenticeship, but already the system had collapsed.

Though such a system is no longer practicable, it is interesting to observe that much of our legislation for the regulation of juvenile labour, many of our philanthropic efforts for the welfare of children and adolescents, are endeavours to find substitutes for all that protection and those educational influences which the mediaeval craftsmen achieved through the apprenticeship system.

O. J. D.

APPRENTICESHIP SYSTEM.—(See PUPIL (TEACHER) SYSTEM, THE.)

APPROXIMATION.—All calculations depending on measurement are necessarily approximate. Perfect accuracy of observation and experiment is unattainable for an unskilled measurement is rarely correct to more than three places and all the resources of science cannot guarantee the exactitude of a result beyond 8 or 9 figures. Again, there are many incommensurable constants which enter

into mathematical and physical problems: these are the sums of infinite series of quantities which become smaller and smaller the further one goes, but never entirely vanish; such are the numerical values of $\sqrt{2}$, π , e , $\log n$, etc. These constants, however, may be calculated to any degree of correctness; thus, the value of π has been determined to at least 135 figures, and only limitations of time, accuracy and persistence preclude its further development. This would be a useless task, nevertheless, for the result of one's calculations cannot (except by chance) exceed in correctness the experimental data on which they are based. "When I was at school," says Professor John Perry, "the mean distance from the earth to the sun was stated as 95,142,375 miles. I wonder why furlongs and inches were not mentioned. The best knowledge we now have of this distance is that it is not greater than 93 nor less than $92\frac{1}{2}$ millions of miles."

An important part of arithmetic, therefore, deals with approximation, the limits of error, and so-called "contracted" methods of calculation, which save time and labour.

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- LANGLEY, E. M. *Treatise on Computation, An Account of the Chief Methods for Contracting and Abbreviating Arithmetical Calculations.*
WORKMAN, W. P. *Tutorial Arithmetic.*

APTITUDE.—Natural genius or acquired skill for learning or for doing some particular thing. Natural aptitude varies greatly both with regard to the total mental capacity of the individual, and to the application by the individual of his attention to single subjects of thought or work. The "genius" has usually abnormal aptitude in one, or a few, directions (e.g., music, mathematics, language). The greatest number of persons are of average ability. At the bottom of the scale are the "sub-normal," or defectives, whose aptitude is low and usually incapable of development.

APTITUDES.—(See INDIVIDUALITY.)

AQUARIUM, THE SCHOOL.—Before deciding on the nature of the vessels to be used as aquaria in schools, a visit should be paid to the pond to observe the plants and animals in their natural haunts. An almost stagnant pond, disused canal, or backwater of a stream (not one frequented by ducks) will yield the best results. It will be noted that the floor is sandy or muddy, and that numerous water plants grow from the bottom or float on the surface. These green pond-weeds not only supply food, but give off oxygen, help to aerate the water, and so make life possible. The water is shallow rather than deep, and it is lit from above. These conditions need to be reproduced as faithfully as possible in the school aquaria. The ordinary round fish bowl is obviously unsuitable, admitting too much light and offering a restricted air surface. Glass jam jars, though easily obtained and good for observation, suit the beasts (especially the vertebrates) little better. Pie dishes, pudding basins, earthenware trays would do admirably for the animals, but do not afford such good observation for a class. Remembering that some animals will eat others, and compromising between the needs of the animals and those of the children, the teacher will probably decide on a variety, and

employ dishes, pans, jam jars, and rectangular tanks, with perhaps one very large square battery cell, in which a variety of the less dangerous animals may live together. In each case, some well-washed sand should be placed at the bottom. Sprays of Canadian pond-weed or watercress floating in the water will do for the smaller vessels. In the larger ones, the roots of water starwort or water buttercup may be "planted" in the sand, and kept in position with gravel or stones.

Gold fish, sticklebacks, and minnows should not be kept unless a large tank is available. A good supply of weed may give adequate aeration, but

some artificial device such as that shown in Fig. 1 is advisable. The small reservoir must be replenished every day, and the clip below so adjusted that a drop falls at intervals, carrying a bubble of air into the aquarium.

Obtaining Specimens. The best time for visiting the pond for stock is in early spring, about April or May. A strongnet may be made of muslin threaded on a bent cane, the two ends of which are tied firmly to a bamboo rod (Fig. 2). A fish-can for fish, a vasculum or tins for weed and small stock, and one or two jam jars for spawn

too many tad-poles, as they serve for teaching and as food for the beasts. Adult amphibians should not be taken home in water, as they breathe air.

The Nurture of Specimens. In the school the animals may be kept separate, if desired; but it will be more interesting to put several kinds together; thus: (1) Tadpoles, caddis, snails; (2) newts, fish, and snails (but ensuring a means for the newts to reach the air); (3) carnivorous beetles and snails; (4) caddis, dragon-fly larvae, and snails; (5) silver beetles, fish, and snails.

Dragon-fly larvae should be provided with means for climbing into the air when they change into the fly state. A superstructure of muslin will prevent their escape.

Snails and the large silver beetle will live on pond weed or watercress. Tadpoles and caddis eat weed, but also like tiny shreds of raw meat occasionally. Sticklebacks, minnows, and dragon-larvae devour meat, or blood-worms or gentles (obtained at naturalists). Water beetles and scorpions will eat live tadpoles and meat. Water spiders will eat bloodworms, but seem to prefer the miscellaneous small life of the pond. Dragon-fly larvae will live on blood-worms or tadpoles, and so will newts. Frogs should be taken out of their vivarium and coaxed with worms, smooth caterpillars, and gentles.

G. G. L.

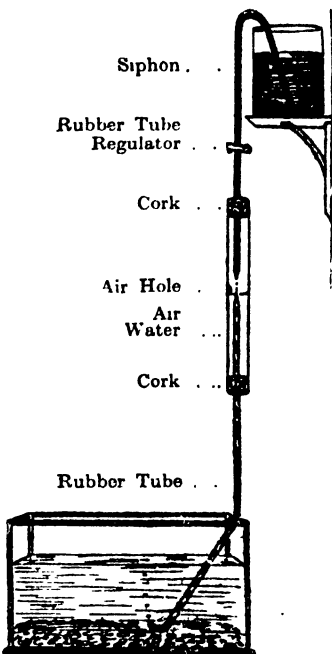


FIG. 1. Aerating Apparatus.

will be wanted to convey the animals to school.

The net should be thrust well into the weeds and dragged slowly along through them for two or three yards, and then drawn out for examination. With ordinary luck, there will be plenty of weed, some of which will at once be placed in each receptacle. There should be pond-snails in variety, and perhaps their jelly-like spawn clinging to the leaves. These may all go into the vasculum, as they live out of water for some time. Sooner or later may be found various water beetles or water scorpions, or the lively waterboatmen; these for the vasculum also. Rarer specimens, especially carnivorous creatures, had better be placed in smaller tins well packed with weed. The water spiders want to travel home in water—likewise any fish. Different parts of the pond should be "dragged," not forgetting the muddy floor, which often yields the intensely interesting "caddis worm" concealed in cases of twigs or leaves. (These for the vasculum also.)

Masses of frogs' spawn or tadpoles may be collected by dipping a jar into the water and letting them float in. One can hardly have

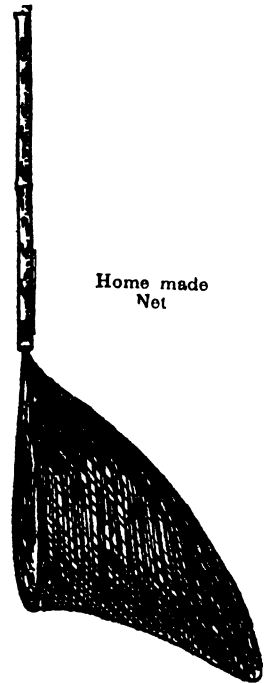


FIG. 2.

AQUARIUM.—(See APPARATUS, HOME-MADE.)

AQUINAS, THOMAS (1227-1274).—This famous mediaeval schoolman was trained in the established methods of the early thirteenth century, and, with slight modifications, his influence perpetuated them. His earliest masters were the Benedictines of Monte Cassino, near his native place, Aquino. He then came under the influence of the newly-established Order of Friars Preachers—the Black Friars or Dominicans. Through them he went to Cologne and studied under Albert the Great, following that master, in 1245, to Paris. There his ability was recognized owing to his answer in the schools to Albert the Great; and in about 1252 he began to lecture publicly. In 1257 he was received as a doctor by the University of Paris, in spite of its hostility to the Friars. After that he lectured at various places, and eventually died near Terracina. He was canonized in 1323, and is known, after the mediaeval manner, as the "Doctor Angelicus." His view of life and the

universe was taken from a cloister: he had little contact with the world of affairs, and no experience of domestic, political, artistic, or scientific life. With such limitations, his achievements seem wonderful. The philosophy of Aquinas is referred to under Scholasticism. Educationally, Aquinas stood for the highest intellectual development, and he counteracted the fear of intelligence which earlier mysticism had almost persuaded the Church to enforce. He won over the Church officials to the support of education in general.

In the subject-matter of education, his influence was not different from that of most mediaeval thinkers; and his work had no effect except in the universities. He has no characteristic view of education. His commentary on Aristotle's theory of education in the *Politics* is a merely verbal explanation; and the references to contemporary experience reduce themselves to remarks such as that the flute excites passion, "as we see it now used in war, both for that and to terrify the enemy." He agrees that flute-playing obstructs the use of reason: *fistulationem prohibere usum rationis rectum*. Apart from the general influence of scholasticism, that of Aquinas on education was in method rather than in subject-matter. In method, the *Commentaries* must be distinguished from the *Summa Theologica*, the *Contra Gentiles*, and the *Opuscula*. The *Commentaries*, especially those on Aristotle's works, are exact and abrupt explanations of what Aquinas believed the author meant, with little indication of the commentator's views. Doubtless these are implied; but, so far as the method goes, there could be no clearer understanding of the true province of commentary. There is little reference to the language, but a sustained concentration upon the meaning of the text; and the result is so persuasive, even when from our modern knowledge of Aristotle we cannot accept it, that Aquinas's meaning is practically what Dante and the early Renaissance scholars meant by "Aristotle." Educationally, the effect of this was to reinforce considerably the weight of tradition; but the influence of Aquinas upon method is even more important because of his omissions. His name, justly or not, has stood for the discussion of natural phenomena without recourse to experiment.

His original works reinforced the thirteenth century method for acquiring exact knowledge. The *Summa contra Gentiles* is, in its beginning, literary and even emotional; but, all through, the effect is rather that of exact distinctions and abrupt statements. The *Opuscula* cover a large number of subjects, chiefly metaphysical, in the same exact style as the *contra Gentiles*; but it is by the *Summa Theologica* that Aquinas has chiefly influenced educational practice. Its method is systematic. It aims at expressing, in consecutive form, the whole view of the Universe as established in the thirteenth century; but, chiefly from the point of view of "revelation." Thus, although geography, astronomy, physics and even political theory are implied, the emphasis is upon what we still call theological statements. Each leading principle of the orthodox faith is examined; the arguments against it are given; then a general indication of "the truth"; and, finally, replies to the arguments. This method has continued, with some Cartesian modifications in the seventeenth and eighteenth centuries, to be that used in seminaries and novitiates; and it was revived, along with the general Thomistic revival, under Leo. XIII. Even when

not exactly followed, its educational effect is (1) a great exactness of thought, both in its systematic connection of statements and in the perception of the value of proof; and, on the other hand, (2) so great a concentration of thought upon few propositions, that little energy is left for the always-extending sphere of knowledge. C. D. B.

AQUINAS, THOMAS.—(See SCHOLASTICISM.)

ARABIC EDUCATION AND LEARNING.—(See MOHAMMEDAN EDUCATION.)

ARABIC IN SPAIN, THE TEACHING OF.—

Previous to 1907, there was only one course of Arabic in the universities of Spain. It was confined to the rudiments of the written language, and consisted of about 150 lessons (Oct.–May, inclusive). Thanks to a careful selection of the more important rules, and the exclusion of subtleties, idioms, and exceptions, most students learn to translate vocalized texts; and one or two succeed in reading and translating texts with the vowels omitted. Once the lessons are over, they seldom find the need of recalling the little they have learned and of showing they have not forgotten it. The syllabuses give no place to Arabic except for the degree of Doctor, for which one of the optional subjects has been, since 1913, Arabo-Spanish (Moorish) literature. The title of Doctor is required only of candidates for a university professorship, and few trouble themselves with this subject. Moreover, the number of students taking Arabic has always been very small (it does not exceed sixteen), because the school of Literature leads to nothing much except certain masterhips in public secondary schools or university professorships. Even supposing the students pursued their studies with the maximum of profit, no result could be obtained other than the manufacture of translators of written Arabic, qualified to undertake historical research. The perfect mastery of a language like Arabic, the popular pronunciation of which does not correspond to the written characters, presents four quite distinct phases: (1) Translation of Arabic texts; (2) translation into Arabic; (3) interpretation of spoken Arabic; and (4) correct conversation in that idiom. Only the first of these results can be obtained from the single university class which was established to produce scholars qualified to make researches in the history of Spain under the Moslems. The other three are not thereby secured, and yet, when European nations penetrate into Mohammedan countries they are indispensable for the training of interpreters, consuls, diplomatists, masters of native schools, administrative officers, etc.

The Moroccan question becomes more urgent every day, and the authorities realize how necessary it is for them to prepare a scheme for teaching Mohammedan languages and institutions. A few half-hearted, casual steps were taken in 1907 by the Liberal Government. Professorships of popular Arabic were founded in the commercial schools at Barcelona, Valencia, Malaga, Cadiz, Palma (Majorca), and Santa Cruz de Tenerife; but a knowledge of Arabic was not required of those who were to undertake responsible administrative work. In 1910 a Chair was founded at the School of Commerce at Madrid, and, in 1913, another at the Central School of Languages. But in nearly all these schools the professors have had no pupils

at all, nor have they any to-day. They all suffer from the same inherent defect, due to a widespread belief that there is a Moroccan-Arabic vernacular which can be taught and learned outside Morocco without any knowledge of the classical idiom.

The profound difference in this dialect between the spoken word and the written word, together with the suppression of the major part of the vowels in writing it, make it very nearly impossible to learn it properly by the "direct method" outside the country in which it is spoken. All the vocalic delicacies of inflexion and mutation, so essential in the Semitic languages, lose their definiteness if the direct method, divorced from writing, is employed. Besides, the vocabulary which can be acquired by this method is always very limited, for it reduces itself to that which the teacher possesses. Should the pupil desire to increase his vocabulary independently, he must consult Arabic dictionaries, which, arranged as they are in order of roots and not of words, require a knowledge of accidence so that the roots may be extracted. Again, the Arabic of Morocco taught in commercial schools is meant to be an instrument of mercantile intercommunication—especially a means of drawing up and interpreting commercial documents. Now, everybody knows that written Arabic is an utterly illegible cipher without the key of grammar; and the less correct it is, the more impossible it is to decipher.

The Hispano-Moroccan Central Society has established schools of popular Arabic at Madrid, Barcelona, Valencia, and Saragossa; the Athenaeum at Madrid has organized the same sort of teaching in its upper classes; the Higher School of War, the Infantry Academy at Toledo, and similar institutions¹ possess professorships of the same kind, all exempt from classical influence.

Some of these classes are joined by many young people, but the teaching² method soon discourages even the most enthusiastic; and the schools, unless they happen to have official sanction, all close down abruptly in consequence of the indifference of the students, who quickly abandon them.

The Central Institute of History, which has been at work since 1910, is very like the *École des Hautes Études* at Paris. There a few post-graduate students are occupied with historical investigation in collaboration with the professors. In 1911, two professorships were founded: one having the political and social institutions of Moorish Spain, the other the history of philosophy and theology in Spanish Islam, as their provinces. The subjects of research were associated with the study of modern Morocco, and the literary language was supplemented by the study of the Moroccan dialects. Since 1917, these two professorships have not existed.

The Ministry of Foreign Affairs founded, in 1912, the Independent Institute of Instruction for the Diplomatic and Consular Services and School of Moroccan Studies, under the *aegis* of the Royal Academy of Jurisprudence. The department of Moroccan Studies is divided into two branches, in which instruction is given in popular and in classical Arabic respectively.

de M. A.

¹ At Ceuta and Melilla there are classes in popular Arabic and Rifian for soldiers. I know nothing of their organization or method; but it is reasonable to suppose that the teaching shuts out classical Arabic, the results, however, are perhaps less unfavourable, because of the intercourse with the natives.

² The grammar generally adopted is *Rudimentos del arabe vulgar*, by P. Lerchundi, a useful and convenient manual for the reader who knows something of the written language, but inadequate—as all works of this kind for beginners are—outside Morocco.

ARABIC NOTATION.—Few improvements in arithmetic have proved more valuable than the introduction of the system of writing numbers in the Hindu-Arabic manner. The efficacy of the method depends on the employment of a symbol for zero, and the use of place values. By these means, ten symbols—0, 1, 2 . . . 9—suffice for the expression of any number, however large, and the notation greatly facilitates all arithmetical processes. Without its aid, men have usually relied for ordinary practical calculations on the abacus or other mechanical apparatus.

This system of numeration was evolved in India, and had there taken definite form before the end of the eighth century. The extent of the Arab conquests in that and the previous century, and trade requirements, compelled the new rulers to study arithmetic; and they, recognizing the superiority of the Indian over the Greek system, adopted it at once. It is possible that it also made its way independently of them from India into Persia. In the ninth century, and may-be earlier, it had become the usual system among the Moslems; and, through travellers, pilgrims and traders, its existence was known elsewhere. The earliest definite description of it published in Europe was given by Leonardo of Pisa in 1202. Leonardo's father was a commercial agent in Barbary, and there the lad had become familiar with the system, and with the Arabic writings of Alkarismi in which it is expounded. Leonardo's work had considerable influence, so that, by the middle of the thirteenth century, Italian merchants and European men of science were commonly acquainted with the notation and the processes founded on it.

Among men of science, the new system was generally accepted. In Italy and Greece it also came to be freely used in commerce, and, since European trade at that time was largely in Italian hands, the more important merchants elsewhere became acquainted with it. A knowledge of it was further spread by the wide circulation of almanacks and calendars, which, after the end of the thirteenth century, often included an explanation of the use of the Arabic symbols, to which the rules of arithmetic *de algorismo* were frequently added. But outside Italy, most merchants continued to keep their accounts in Roman numerals till the middle of the sixteenth century, and monasteries and corporations till somewhat later. No instance of a date or number being written in Arabic numerals has been discovered in any English parish register or manor roll before the sixteenth century; there is one instance in Scotland in the year 1490.

By the close of the sixteenth century, the notation had become common in Western Europe. About this time, it was further extended to fractions by the introduction of a decimal point or other similar mark: this greatly increased its value. The symbols used have only slowly taken the forms now current.

W. W. R. B.

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SMITH, D. E. and KARPINSKI, L. C. *The Hindu Arabic Numerals*. (Boston, U.S.A., 1911.)

ARANDA, COUNT OF.—(See ABARCA Y BOLEA.)

ARCHAEOLOGICAL AIDS IN THE TEACHING OF ANCIENT LITERATURE AND HISTORY.—In the study of the humanities, ancient or modern,

the constant tendency—which needs to be resisted—is towards bookishness: that is, the student inclines to save himself the trouble of imagining to the full the scene, the material object, or the sentiment, and to give himself up to what is nearest to hand—the word, the grammar, the form of the sentence. To this undoubted tendency one of the best antidotes is the proper use and study of visible and tangible objects, which, rightly used, have been found very useful in bringing home the reality of ancient literature and history.

Of the general psychological principle, few classical teachers need to be convinced. But they have two difficulties: first, how to secure the archaeological material; and, second, how to use it without making too serious inroads on their time-table.

The Help of Public Museums. We have many excellent public museums in England, where objects connected with Greek and Roman life can be seen admirably arranged and labelled in cases. At the British Museum is a capital collection, illustrated by a good guide; at Reading is the fine Sulchester collection; and at Chollerford, Northumberland (a somewhat remote locality), is the splendid Chesters museum, which could hardly be surpassed as an introduction to Romano-British life. But comparatively few teachers can take their pupils to such collections; such a visit is apt to be wearisome; when they get there the pupils cannot handle the exhibits; and, even if they could, they would not do so “in the nick of time.” A coin or a vase, or a stilus in the hand during the lesson, is worth a dozen such in a case two or three days later. All classical schools should possess their own archaeological material, not necessarily laid out museum-wise to become pointless by indiscriminate and uninstructed gazing, but better in the cupboards of teachers who know when to produce the objects and what to say about them.

Travelling Collections. Failing such proprietorship, the best that can be done is to organize travelling collections, of which, for a small fee, schools may avail themselves. Some years ago Dublin University organized such loan collections, and the value of them was instantly and widely recognized. In England a beginning was made by the Association for the Reform of Latin Teaching at its meeting at Cambridge in the summer of 1913. Here, under the enthusiastic guidance of Professor Henry Browne, of Dublin, a committee was formed under the name of the Realien Committee (a name recently changed to Archaeological Aids Committee), with Mr. S. E. Winbolt, M.A., of Christ's Hospital, as hon. secretary. A useful collection was soon formed, which began to be circulated in October, 1913. Schools pay a guinea a year for the first two years of membership, and thereafter half a guinea, for which subscription they have the right to use, for a fortnight or three weeks each, all the different sets of exhibits, the cost of carriage outward being borne by the Committee and the return carriage by the school. Teachers in London schools have, from time to time, acted as voluntary custodians of the various sets of material. Given proper arrangements for packing, the exhibits stand the wear and tear surprisingly well.

The kind of objects circulated have been of three main kinds—

SECTION A: Coins. Nine cabinets, containing some hundreds of coins, interesting historically and aesthetically, have made many journeys, and not a single coin has been lost during four years' working.

Two cabinets of casts of Roman *Aes Grave*, and one each of the following, have added life to classical reading or history lessons: Original coins of the Roman Republic, original coins of the Roman Empire, original silver coins of Sicily, casts of coin portraits of Roman emperors, original coins of the Greek Mainland; and a collection of Roman, Greek, and Egyptian electrotypes coins in two cabinets. These are accompanied by full catalogues and suitable books on numismatics.

SECTION B: Casts, Models, and original Antiques. Plaster casts of objects in the British Museum and elsewhere include a diskos, mirror, helmet, sword, phalera, figures of tragic and comic actors, and so on; among models are those of a Roman book, writing-tablets, catapult, military tortoise, hand-mill, and the *Corvus* or boarding platform used by the Romans in naval engagements with the Carthaginians. Several restored antiques from the British Museum—by the kindness of the authorities—were put in circulation (e.g., among others, Mycenaean oil jars, Roman oil flasks and lamps, an Attic black-glaze bowl, the neck of an Attic black-figure vase, a bronze mirror, ear-rings and bracelets).

SECTION C: Wall Pictures and Photographs. These included pictures of Roman and Greek dress, ships, arms, engines of war, theatres, houses, furniture, and so on.

Method of Use. With such material to hand, a most profitable ten minutes can be spent with a class at the close of the lesson, or ten minutes can even occasionally be used in the lesson itself, when, e.g., on the mention by Livy of a sum of money in *asses*, the *Aes Grave* is produced, handed round, and explained. Moreover, not only is the thing realized visually and tactually, but casts of the most beautiful coins are very easily produced by the boys on a wet afternoon, and these, mounted on a card, are introduced as an ornament into the classroom. The models are copied by the keener spirits in the carpenter's shop, and our own *Corvus*, or catapult, makes us independent in future of the travelling collection.

Wherever these auxiliaries to teaching are tried, they are pronounced to be a decided success. Their value need not be exaggerated, nor should a disproportionate amount of time be spent on them; but the use of such material spells a very distinct advantage. Such archaeological aids can easily, and should certainly, be popularized. S. E. W.

Reference—

BROWNE, HENRY. *Essays on the Reform and Revival of Classical Studies* (1917), pp. 117–281.

ARCHAEOLOGICAL ASSOCIATION, THE BRITISH.—This Association was formed in January, 1844, by a self-elected Committee of twenty-two members for the purpose of collecting all kinds of information that could be obtained relating to antiquities and to the remains then daily being brought to light by the progress of railway work. A committee of six was appointed to compile a Journal, in which the results of the labours of the members were to be recorded. A dispute among the members in the first year of the Association's existence led to a secession and the establishment by the seceders of the Archaeological Institute.

Members of the Association are either Associates or Correspondents; the former subscribe one guinea or upwards annually, receive copies of the Journal, and attend meetings.

The Journal is published in London, and contains accounts of the proceedings, notes on new publications, and papers on archaeological subjects, illustrated by engravings and photographs contributed by members.

The Association meets in the rooms of the Royal Historical Society, 22 Russell Square, London, W.C.1, where the library is now to be seen.

ARCHAEOLOGICAL INSTITUTE, THE ROYAL.

—This Institute was founded in 1843 to encourage research into British antiquities and to take steps to ensure their preservation. It has advocated increased attention to all national memorials of every age, and has endeavoured to throw light on their dates and peculiarities.

The members of the Institute pay an entrance fee of one guinea and, on further payment of fifteen guineas, may become life members; annual members and subscribing societies pay one guinea per annum. Candidates for membership must be nominated by a member of the council or by two ordinary members.

A Journal is published quarterly, and is free to members. It contains the chief papers read at the meetings and reports of the proceedings. The Institute also publishes various works of antiquarian interest.

Eight meetings are held during the session. In summer, a meeting lasting a week is held at some centre convenient for visiting ancient memorials or historical sites; excursions are taken under qualified guides, investigations made and papers read and discussed. Spring and autumn meetings are held for the study of antiquities in or near London.

The offices of the Society are at 19 Bloomsbury Square, London, W.C.1.

ARCHAEOLOGY.—Archaeology is the handmaid of history, and history needs all the help she can get. There are so many gaps in history—the things and events which have not called forth their historians, and the histories that have been lost. It is only of late years that archaeological work has been carried out in a scientific fashion, so that its results could be used for its full purpose. The sites of cities, some of them unknown or forgotten, have been excavated foot by foot; monuments, inscriptions, coins, sculptures, pottery, tombs, temples and other remains have been discovered and placed in their proper position in relation to each other, until the whole realm of man's activity in the prehistoric past and within historic times has been made to yield remains which have been hidden from observation until recent years. Every item of such remains is an historic document of equal value to the written page.

Archaeology is, therefore, of great educational value, and should be taught from the point of view of its value and not as the hobby merely of a curiosity collector. It can be taught in every town and village in Europe, because man has swept through the whole of Europe from the oldest stone ages—palaeolithic—down to modern days, writing his progress under the earth's surface, or leaving his destroyed homes to tell the tale of conflict and change. The teaching, indeed, should begin with the school place; to know something of the life-history of one's own home is the surest path to good citizenship.

Archaeology depends mainly upon discoveries

in the open, or upon ancient buildings or monuments still in use. It is essential that the find-spots of discoveries and the topography of the existing monument should be the first lesson to be taught. It is worse than useless—it is misleading—to produce an ancient stone implement, a piece of pottery, a weapon, or any other object of interest unless, at the same time, the exact spot is known where the object was found. This is the one thing essential to connect the fragment of antiquity with the human element—the tribe, the stronghold, the city, the nation, or the race to which the object belonged.

Reconstructing the Past. An example or two of the importance of the connecting link between the archaeological object and the human to whom it belonged will bring home the necessity of always recording the find-spot. Prehistoric man spread himself over the surface of the earth without any chance of giving an account of himself. He existed before the age of writing; he had learned to arm himself with stones to fight the animal world which opposed his progress. He began by using the first stone he could lay his hand upon; then a fashioned stone, chipped almost to the shape of our modern axehead in metal. With this primitive weapon, he obtained his animal food and defended himself from animal enemies. One of the animals thus to be dealt with was a species of oxen, now extinct, known as *bos primigenius*: and an interesting archaeological find near the village of Reche, in Burwell Fen, Cambridgeshire, tells a whole story by itself.¹ The head of an ox of that species was discovered lying upon the chalk-marl and covered by about 4 ft. of peat. It was broken across at the level of the upper margin of the orbits of the eyes, and a flint implement was found firmly fixed in a fracture of the frontal bone. This implement has penetrated the skull to a depth of 2½ in., and broken off at what was the outer surface of the skin of the animal. It meant death to the huge animal; and, as no human bones were associated with the find, it meant food, or, at all events, life, to the wielder of the stone axe.

Every one knows the story of the great struggle between Greeks and Trojans as related by Homer's deathless verse, but it was reserved for Dr. Schlieman to "dig up Troy" and prove from archaeology that Homer was historian as well as poet. The great finds in Egypt, Babylon, Assyria, the cities and temples of Greece, the island of Crete, open up chapter after chapter of history not to be found in any written form. In our own country, the excavations into Roman cities occupying sites in country fields—such as Silchester, on the borders of Hants and Berks; and Wroxeter, in Shropshire—are the only means of getting to understand the Roman occupation of this country. Rome has left no history of her doings here; but, when we, with our spade and shovel, uncover the foundations of houses once occupied by Roman soldiers and civilians, we find ourselves able to write several chapters of history. Thus at Silchester, the skeletons of a man and a woman in close association with a hoard of coins, and with evidence of fire which overwhelmed them, reveal the dismal story of fugitives from the destruction of the city by the Anglo-Saxon conqueror.

There is, indeed, a long story to tell of such scenes as these from the records of archaeology. The places

¹ *Cambridge Antiq. Soc.*, II., 285.

must be actually visited. To interest the schools, a beginning should be made in the immediate neighbourhood. Earthworks, stone structures, buildings, should be classified according to the periods to which they belong; and they should be visited and explained as nearly as possible in chronological order, not jumbled together simply as ancient places.

Roughly indicated, the principal periods are—**PALAEOLITHIC.** Stone implements and human skeletons.

NEOLITHIC. Stone implements, pottery, barrows, dolmens, stone circles, strongholds, and hill sites.

BRONZE AGE. Stonehenge and similar circles, strongholds, camps, ancient roads, pottery, and burials.

EARLY IRON AGE. Lake dwellings as at Glastonbury; implements for agriculture, war weapons, pottery, camps, dwelling places.

ROMAN AGE. Camps in open fields (Silchester, Wroxeter, etc.); in occupied cities (London, York, Chester, Cardiff); in occupied villages (Caerleon, Caerwent); Roman roadways; objects of Roman culture found in wells and on excavated sites; burial places; camps; coins.

ANGLO-SAXON AGE. Burial places; fortified places (Wareham); villages in all central England; agricultural lands; objects of domestic use; churches (Deerhurst); remains in later churches (Westminster); place-names; dialect; village pounds, stocks, pillories, coins.

MEDIAEVAL AGE. Churches, castles, buildings of various kinds, articles of domestic use, armour, monuments.

TUDOR AGE. Architectural features in houses throughout the country; furniture and internal decorative work; gardens; village cottages and homes.

JACOBÆAN AGE. Same as Tudor Age, brought down to the later period.

Except in garden cities, coal-mining centres, and modern commercial towns, some one or other of these features strikes the dominant note of a school centre; and, even in these excepted places, there may be geological discoveries worth noting.

Methods of Study. Study may be conducted in two ways: chronologically or locally. A locality which possesses remains of several periods should be sharply defined chronologically. If it be possible, it is best to conduct investigation and observation not in special localities to deal with everything of all ages, but to study all remains of a given period within a defined area. The important thing to remember is the necessity of understanding what each group of archaeological objects tells of the past in each locality, and this can only be done in periods, each study being devoted to one period. By this plan, everything will be noted and every taste satisfied, and confusion will be avoided. The use of maps is very important. A section of the ordnance survey map should form the basis of every consideration given to an archaeological site. The ordnance survey must be checked. The adoption of different colours to mark on the survey maps the spots which belong to each period will, in the end, produce results of the highest interest, indicating in a way not to be attained by any other method the unique or varied characteristics of each locality of study.

Before a visit is made, care should be taken to explain the various periods from text-books. The library of a school centre should be a reflex

of the archaeological character of the locality. The local museum is, of course, another source of information; but, as this will be dealt with in another section of this work, it is not necessary to do more than direct attention to it here.

Care should be taken that no possible damage is done to any archaeological monument; no writing of names, no chippings from the stones, no picking up of stray articles. Photographs or drawings should always be encouraged, and the date when these are taken should be carefully recorded. Students should, above all things, be taught to watch carefully each object of archaeological interest, in order to prevent not only its wanton destruction or spoliation by ignorant persons, but the far greater danger from destruction of another kind: the transfer of beautiful decorations from their original site to do duty in another place, or the pulling down of a monument in order to erect it elsewhere; such, for instance, as the example of London gives evidence—Temple Bar having been removed to a private residence, and Crosby Hall pulled down on its historic site in the City and re-erected in Chelsea.

There is one particular feature of archaeological work which should be specially attended to, namely, the roads. These are of two classes: the prehistoric cattle tracks, and the Roman military roads. They are represented partly by modern roads and partly by green paths traversing cross-country tracks. These green-roads are the unused roads of the past, and open up a great means of archaeological discovery. They cannot be traversed by bicycle or motor. They can only be walked, and they remain largely untouched by the trained archaeologist. They should be examined foot by foot: an inscribed stone may be discovered; a curious twist in the direction of the road may afford immense evidence of events and their results; their relationship to ancient sites, to hills and even to modern towns, is of considerable importance; their construction in reference to low-lying swamps and to deep declivities—everything relating to them needs careful observation, and every well-authenticated fact about them should be diligently recorded.

With the carrying out of plans as here indicated, there would gradually grow up many incidental advantages. The archaeological atmosphere of the place would be stamped on the minds of residents whose teaching in early years had proceeded on these lines, and local authorities or private undertakings would soon provide the necessary means of conveyance to the various sites as a constant source of enjoyment.

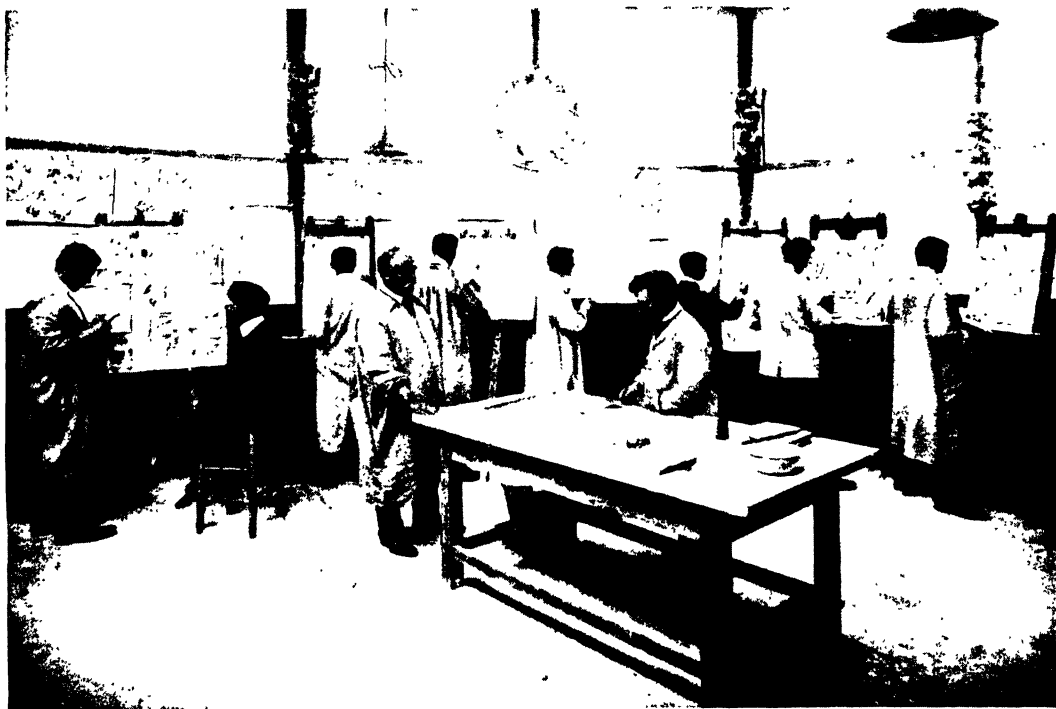
L. G.

ARCHAEOLOGY IN EGYPT, BRITISH SCHOOL OF.—The enthusiasm of Professor W. M. Flinders Petrie for archaeological research has led him to devote many years to excavations in Palestine and Egypt. His labours, as set out in a number of volumes published under the auspices of the British School of Archaeology in Egypt, have added much to our store of knowledge of ancient and prehistoric Egypt, and have gone far towards settling many disputed chronological questions.

The Society was established in 1894, and has spent annually large sums in excavations under the direction of Professor Petrie, who has collected a very large store of remains, which were annually exhibited at University College, London, all carefully labelled and catalogued in chronological order. Here can be traced the development through centuries of a type of pottery or a style



Edinburgh College of Art. Sculpture Court



Edinburgh College of Art. Plasterers' Class

of bead manufacture, and inferences can be drawn as to the decadence or otherwise of art or handicraft from one dynasty to another.

In 1915, the collection was bought anonymously from Professor Petrie and presented to University College, where it will be perpetually kept for public exhibition.

Various publications have been commenced discussing subjects in the collection [*e.g.*, amulets (1914), scarabs and cylinders (1915)]. Others on tools and weapons are to follow, thus providing a complete series of text-books on Egyptian archaeology. The Society also publishes *Ancient Egypt* quarterly, containing articles on Egyptian art and archaeology, and accounts of current excavations and discoveries.

ARCHAEOLOGY, TRAINING IN.—(See EXCAVATION AND EDUCATION.)

ARCHERY.—In 1545, Roger Ascham wrote his *Toxophilus* (or the School of Shooting); and though archery as the characteristic English physical exercise has lost its leading position, Ascham's treatise on Archery is a national classic, for, in his prefatory address, Ascham states: "I have written this *English matter, in the English tongue, for Englishmen*." He goes on to claim that archery is the exercise according to the "old wont" of England. Above all, archery is a manly, open exercise, a contrast to the reading of books of "feigned chivalry." It is good also for all times of life. Shooting is suitable for children, because it is an imitation of the serious avocation of manhood. No pastime is more fitting for the scholar, where he turns from "poring on a book." It is the best pastime for peace, because it is a most "sure weapon in war." Antiquity is cited, particularly the Greeks, Jews, Persians, Romans, the Crusaders, and the modern peoples. Ascham follows Elyot's view that the Saxons in King Vortigern's days brought archery into England. The prowess of the English archers in the Hundred Years' War was a proud tradition. From the time of Edward I, Acts of Parliament had enjoined the practice of archery in England. No doubt an ordinance of Henry VIII's reign in 1541 to this effect had stimulated Ascham to write the *Toxophilus*. This ordinance required every man up to 60 years of age to exercise shooting in long bows, and to have bow and arrows "continually in his house"; to train every man and child in his house, from 7 to 17 years of age, in archery; and ordered the master of the house to buy bow and arrows for all men-servants, and to dock the amount from the men's wages. Richard Mulcaster said, in his *Positions* in 1581: "What good is there in any particular exercise, either to help natural heat, or clear the body and the senses, to provide appetite, to strengthen the sinews, or to better all parts, which is not altogether in this [*viz.*, archery]? The archer between his 'marks' can 'run or walk, dance or hop, helloo or sing'; or in short, exercise himself vehemently or gently."

Archery for Women. Archery was also an exercise for women, as well as men and boys. Gower describes a woman-archer. Queen Elizabeth was a bow-woman. Queen Victoria not only was an archer, but in the early years of her reign, appointed a "Master of Archery" amongst her household officers. (G. A. Hansard.) In the later half of the eighteenth century, there were a considerable number of companies or societies of "Foresters,"

"Woodmen," "Archers," etc., of women-archers. But the fashion has passed over from archery to golf.

Archery in the Schools. Archery, it should be noted, was the precursor of cricket and football as the chief physical exercise of schoolboys. In 1549, the ordinances of the newly-reconstituted Shrewsbury School direct the play of the boys to include shooting in the long bow. In the Witton Grammar School Statutes (1558), scholars in play-days, both in term-time and in vacations, were to "use bows and arrows only." In 1570, the Articles of St. Albans School directed parents and guardians: "Ye shall allow your child at all times, a bow, three arrows, bowstrings, a shooting-glove, and a bracer to exercise shooting." In 1571, the yeoman John Lyon founded Harrow School, and expressly directed the practice of archery. As at St. Albans, parents were at all times to allow children bowshafts, bow-strings, and a bracer. In 1574, Queen Elizabeth, in her Injunctions to Dedham School, Essex, directed parents of boys at free schools, and at this at Dedham particularly, to furnish boys with bows, shafts, bracers, and gloves.

In Ordinances, the original documents of which are supposed to date from 1582, the masters are to exercise the boys with their bows in matching either with themselves or with strangers "in the ox-pastures or in Houghton Moor." The position of the old "butts" at Harrow is known. At Eton, "the shooting fields" point to the old practice of archery, and the position of old school "butts" has also been recognized at Warwick. Statutes as late as the foundation of Wigan School required boys to shoot the long bow for their play. Archery matches at Harrow ceased in 1771. In the University, students practised archery: *e.g.*, in the sixteenth century, Nicholas Ridley and Roger Ascham, "in accordance with the Statutes of St. John's, Cambridge" (C. Wordsworth: *Univ. Life in the 18th Century*, p. 92.) F. W.

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 SMITH, SIR JOHN. *Certain Discourses of Weapons* [including the Long Bow]. (London, 1590.)
 An interesting modern book may be added:
 RUSHTON, W. L. *Shakespeare as an Archer*. (London, 1897.)

ARCHES, SCHOOL OF THE.—In the reign of Henry I, there were three official schools in London: St. Martin's-le-Grand, St. Mary-le-Bow (in Cheap-side), and St. Paul's. Anyone teaching in any other school without the licence of Henry, Master of St. Paul's, was liable to a sentence of anathema. As late as 1393, a petition was presented, but unsuccessfully, to the king to grant the ecclesiastical powers the sole right to appoint, depose, and examine the grammar masters in London. In 1446, the school of St. Mary-le-Bow, known as the School of the Arches, was selected by a royal ordinance as one of the five schools to which teaching of boys was restricted. The number was, in the next year, increased to nine. The school was probably held in the crypt, of which only the arches and pillars survived the Great Fire of 1666. The name of St. Mary-le-Bow was given to the

church on account of its being built on arches of stone. Christopher Wren constructed the new church on the original pillars and arches. The new school was a Ward school from 1714, and was removed to Shooter's Hill in 1855.

ARCHIMEDES.—He was born at Syracuse in 287 B.C., and is celebrated for his discoveries in mechanics and hydrostatics. He was the first of the ancients to understand the principle of the lever, and to discover that the loss of weight of a body immersed in water is equal to the weight of the water it displaces. He lost his life when the Romans stormed Syracuse (212 B.C.).

ARCHIMEDES.—(See MATHEMATICS, THE HISTORY OF.)

ARCHITECT, THE EDUCATION OF THE.—It is in the last half-century that there has developed a public concern in the education of the architect. The system has been revolutionized, and the best methods now occupy the attention of many educational bodies. There have come into prominence two theories: one that the would-be architect should obtain an artist's training in design; the other that he should be severely grounded in the practical knowledge of a building science. According to the former theory, he is to cultivate his own taste; according to the latter he has to develop the capacity to administer the tastes of other people. Under the time-honoured apprenticeship system, the clash of these theories was unnoticed: the architect's pupil paid for being taught his master's craft, continued to practise it as his master's assistant, and, succeeding to art and practice, handed them on, in turn, to a pupil. In this genealogic succession of architects, a uniform habit of building proceeded in leisurely development—because the system of apprenticeship in all trades supplied similar successions of executants skilled in all the crafts of building. The failure of apprenticeship has, however, now appeared all round—the crafts of building no longer retain their traditional manners, nor, indeed, their skill of craftsmanship. Thus co-equal partnership between design and craft in building has come to an end, and there has been elaborated instead a machine of architecture whose efficiency for building is got only by a designer dictating every movement. The intention of the architect is conveyed to the execution of the mechanic by a series of irresponsible transmitters, who have no part in the design or interest in its building art. For, indeed, this machine has been coupled up for other purposes—for the legal security of contract, for the commercial profits of sale, for the political exigency of trades unions; for ideas and principles that only incidentally acknowledge the building art of architecture. The architect has now to be fitted to take charge of this machine in his capacity both of artist and of practical administrator of his clients' wishes, and very varying estimates of this two-fold office appear in the courses of architectural schools. The public is seen to be equally uncertain—at one time it takes the architect as a licensed ornamentalist, and condones his inefficiencies on the plea of his artistic sense; at another it claims from him a pure business administration and passes on his works to be decorated by the fancy-goods men.

The best teaching of architecture should discover

no such inconsistency. To it, the personal development of the architect as an artist should be all one with his practical capacity to use the machine of building for the expression of his art. For the power of design cannot be exercised in building except at the commission of a client. Therefore, in a school of architecture, there can be but one educative function—that of fitting architectural pupils to their work in life—*Usui civium decori urbium*—as says the motto of the Royal Institute of British Architects. In the grasp of this principle, the special studies of the architectural curriculum need not wander into all the arts and sciences: they can be regulated to reasonable dimensions—with the premise, however, that the general education necessary for the social commerce of educated Englishmen is necessary to the intending architect, because it is from the educated classes of the community that he will get his commissions. He must meet his clients on equal terms of intercourse and understanding, and on this ground many bye-paths open out to the architectural student in his education of himself, for, according to his temperament and genius, each may take his place in the life of the nation.

The four main departments of essential instruction may be sketched as follows—

1. Draughtsmanship. This is the beginning of architecture under modern conditions, and it makes the first training of the student for the power of his profession. It is only to the plastic muscles of youth and to the sensitive first impressions of the young that the schooling of drawing will impart the precision and perfect ease which are implied in the control of the eye over the motions of the hand. Indeed, it is so important for this physical education to be begun early, that a schoolboy intending to be an architect should be allowed his seat in the life schools of the young professional painter and sculptor. Where this is not possible, the intending architect should at any rate be thoroughly practised in drawing objects from memory, as in the curriculum of the Board of Education. But, as a student of architecture, his powers are to be cultivated for a purpose other than that of hand-skill. By draughtsmanship, the architect realizes his building intention; to himself in his drawings; and by transmission to the executants—surveyors, foremen, and mechanics—in the actuality of building. He must acquire the will of the artist to have no waste nor uncertainty in his delineations. Neither the pretty drawing of sketches, nor the quibbling niceties of perspective are of use in themselves. Only by being exact and economical can the architect's line portray the building and justify the building use of drawing. The measuring up and drawing of ancient architecture should be practised for this purpose, for, by realizing how lines represent the excellencies of building, the architect draws his designs.

2. Historical Architecture. For the last hundred years the knowledge of ancient architectures has been reckoned the equipment of a practising architect. It is, however, conceded—at any rate, of late years—that the archaeology of building styles lies outside the architectural course. However interesting the details of ancient building, the study of them for the purpose of making copies with pretence of the value of the originals is the art of a charlatan. Wardour Street architecture has the scorn rather than the admiration of experts. But, on the other hand, the historical evolution

of building form deserves study as one of the social forces of civilization; and, since this is neglected in the current teaching of the historical student, it is due to the architectural that he should be allowed to ground himself in a faculty that is to be of service to his art. For, indeed, by understanding the economics of the ancient creations of style, the possibilities of our modern arts can be revealed. Moreover, it is unquestionable that, in the study of masterpieces, the artist expands his creative outlook.

3. Materials and Processes of Building. Since in the last fifty years there has appeared a constant decay in the spontaneous skilfulness of the building crafts, architects have more and more taken upon themselves the duty of describing to the building executant his every action, whether of choice in material, or of manner in working. This has meant an education of the architect in many of the special capacities of the working builder. It is evident, however, that the student cannot be apprenticed to a dozen crafts: the knowledge of their practical mysteries can be absorbed by him only as a general principle. Brick, concrete, stone, wood, iron, and the other stuffs that come into his hand, must be understood as the material of his art. He can have no power over his design of building, unless he recognizes his building agents, knows what they can do and how they do it. But to be technically qualified as a builder's merchant will not help him as an architect any more than would the mechanic skill of a bricklayer. He must be given the ability of thinking in bricks, stone and wood without being side-tracked into mere skills of hand. And the same necessity applies to those new crafts of power and service—sanitation, lighting, and engine-use. They are necessary for modern accommodation, and the student must know their practical scope and be grounded in their chemistries so as to have the power to control their uses in the interests of his work for his client. To think of giving the architect the education of an engineer or electrician is absurd.

4. The Professional Machinery of Building. There should be as early as possible the introduction of the student to the system of modern architecture, in which the trades and crafts of building are employed under the agency of the architect. It has to be learnt that a responsibility attaches to the architect in respect of the calculations of the quantity surveyor, the supervisions of the clerk of works, the liabilities of the contractor, the settings out of the foreman, the limitations of the artisan. Only by being practical in the management of such complicated interests can the economy of the artist's conception be exercised to the benefit of his client. Want of experience in the management of the building machine is the cause of many architectural failures, and in this matter our building arts for a couple of generations have been committed to most extravagant wastes. That the architect should now learn to check wastes can be his best plea for existence. He must prepare himself for economy in his draughtsmanship by dispensing with the amiable weakness of pretty sketching—that architects' lure that has deceived so many clients, won so many competitions, and had effect in so many monstrous costs and patent inefficiencies. The student must be taught that the affectations of style are costly, whether they pretend to reproduce classic porticoes or mediaeval cathedrals—and no less when they take the form of barn rusticity and picturesque dilapidation. In materials and processes, the art of architecture

can regain the common sense of using the immediate and the practical. It is not aesthetic economy to face city buildings with imported stone, perishable and costly, when local brick is to hand imperishable and at a tenth of the cost. The dignity of fine building has no need of foreign marbles and patent processes, nor does it thrive on the thousand undigested nostrums of advertised sanitation and engineering—most often scrapped as soon as paid for. It is absurd to pile on to building the costs of our latter-day commercial exploitations of the public. Architects' art can be satisfied in stone dug on the site, in lime from the nearest chalk pit, and in the local crafts of skilled workmen. Therefore, it is expressly the duty of the school of architecture to ground its students in the principles of economy in respect of the machine of his building art. He should be taught simplicity and to be as independent as he can of surveyors, engineers, clerks of works, contractors, and foremen, if he is to maintain his mastery of the building machine in the interests of the community.

Yet the effective teaching of an architectural school has not reached the limit of its office to the student. Though he acquire all the knowledge necessary for the economical practice of building, he may be unfitted because he cannot design architecture. The discovery and training of creative imagination are recognized by all schools as the main objects of their teaching. Most often the accepted models of ancient building are put before the student for this purpose, and he is asked to study their effects and to attempt similar dispositions in problems of design. There is the suggestion that the merit of architecture lies in the obvious beauty of these ancient forms, and that the merit of the architect comes in his reproducing them. Accordingly, the student has been encouraged to become a classic or Gothic stylist, or perhaps to imitate some hybrid or less recognized school of revival, according as his appreciation declares itself. This could be tolerated while the expense of imitative style was recognized as the dignity of architecture to be paid for ungrudgingly. But now, to bring up young architects in the luxurious extravagance of the stylistic habit would be a crime. And, indeed, the meaning of design need not carry with it any of this expensive sense of imitation. There can be demonstrations of space treatment in the provision of building uses—whether horizontally in plan or vertically in elevation—that need not any historical style to introduce them. They can be drawn to express the variations and, therefore, the capacities of the artistic sense, and, as uncommitted to any stylistic theory, they can supply to the student the ground of experiment. For his capacity to make experiments is his claim to be taught. It is specially the function of any right teaching of architecture to gauge not only the ability, but the disabilities of a pupil. If he is without the faculty of creative imagination, however receptive he be of building knowledge, he will be a waster in the ranks of the architects, and it is the duty of the best teaching of architecture to dismiss him for more serviceable training in some other vocation. E. S. P.

ARDINGLY COLLEGE.—(See LANCING COLLEGE.)

ARISTOPHANES AND GREEK EDUCATION.—Aristophanes is the best exponent from a conservative point of view, not only of the transition

stage in Greek education, but of the old education itself. In taking him as a guide, however, the very free licence granted to comic exaggeration, as well as the origin of comedy itself, must be borne in mind. The classic reference to Greek education of this period is in the *Clouds*, a play produced in 423 B.C. Maurice Croiset says: "*Dans les Nuées, c'est à l'éducation nouvelle qu'Aristophane s'en prend, à la rhétorique en particulier.*"

Rhetoric is personified in Socrates, who is made the type of those who, by their teaching, undermine the old ideas and practices. Aristophanes is the mouthpiece of those who believed in the good old days, and were afraid of innovations.

The education of the period before the wars with Persia had been a training chiefly for practical life. Aristophanes, in the *Clouds*, speaking through the character of the *Just Cause*, sketches the old system of education.

"When just speech flourished and modesty was the rule," boys were not allowed to give vent noisily to their own opinions. They had to march through the streets to the house of the music teacher in orderly procession. There they were taught to sit in a seemly position and to chant: "Pallas, awful goddess, destroyer of cities." If the scholars indulged in any buffoonery, or embellished their music with trills, punishment followed. They had to avoid ungraceful motion, speak in a well-modulated voice, and behave quietly at meals. Later, the poet tells us that it was this education which produced the heroes of Marathon. Their time was spent in the wrestling schools instead of the *agora*.

From a boyhood of this kind, he says: "Descending to the Academy, you will run races with a companion of your own age, beneath the sacred olive-trees, your head wreathed with reed, redolent of the wild convolvulus, rejoicing in the spirit of springtime, when the plane-tree whispers softly to the elm."

The censure here indirectly conveyed indicates the nature of the old education. It was the development of physical capacity—perfection of bodily harmony and rhythmic movement and greatness of simplicity. The character of the transition period showed a decline in the old-time severity and an onrush of self-indulgence. Intellectuality shared with bodily perfection. The motive of gymnastic exercises was no longer to fit a man for civic duties, but to acquire physical beauty and the sensuous enjoyment of movement.

Aristophanes declared that the New Education emptied the *palaestrae*; but with increased intellectual activity there is always the tendency to place mind before body.

With this followed changes in the musical outlook. The cithara was less used than the flute. There was a tendency to replace the Homeric poems by newer literature. The whole training of older boys was changed. Under the old *régime*, the first three years were passed in the gymnasium and in political training in the courts, and the last two years in the ephebic military service. This was replaced more and more by rhetorical studies and argument.

M. HOOKER.

ARISTOTLE AND EDUCATION.—Aristotle's view of education is governed by his conception of society, since education is nothing but social adjustment. "The best laws are useless unless

the young are trained by habit and education in the spirit of the constitution" (*Pol.* 1310 A. 1); and "constitution" indicates that society for Aristotle means the Greek *πόλις*, a word not fairly to be translated "state." The *πόλις* includes all those institutions—church, university, club, trade union, etc.—which we regard as promoting the whole of civilized life. Therefore the "lawgiver," who is to concern himself, above all things, with education, must be thought of as the practical social philosopher; and State education in Aristotle does not mean an education directed by a purely political institution, but education directed by the community with a view to the whole of civilized life. It follows, as against Athenian practice, that education in what is of common interest should be the same for all, and the choice of "fancy" subjects by incompetent parents should not be allowed; but also it follows, as against Sparta, that, in what is not common, children should be specially developed; for they are parts of a *πόλις* which is expressly said to differ from an army in that its parts are individualized (*Pol.* 1261, A 24). In this, Aristotle agrees with Plato, and, like Plato, he is influenced by current tradition in the division of "subjects" into gymnastic and music.

The views which are specially characteristic of Aristotle we may deal with under two heads, administration and educational method. As to administration, the general principles asserted are (1) that the system of education should suit the special atmosphere (*τὸ ἥθος τῆς πολιτείας*) for maintaining and developing it; that is to say, every person must be treated as part of a community and no one as an abstract individual; and (2) that there should be directors of education (as also in Plato) who are to supervise both the actual practice of education and the moral atmosphere of the community. But these are authorities in the intellectual rather than in the official sense, and neither Plato nor Aristotle really explains how those who know can obtain power.

As to educational method, in Aristotle most of the space is given to the discussion of music; and the general principle must be gathered from sometimes disconnected sentences in the *Ethics* and *Politics*. In consonance with his philosophical attitude, the end or purpose of education seems to Aristotle most important; for this indicates the means to be employed: but the end is not clear, and Aristotle refers to the various views of it which were currently held. He decides that it is a general excellence or full development of the man which is the purpose of education, leaving this without any too exact description, but with pointed reference to well-being or well-fare (*ευδαιμονία*) as the end of life. Education must produce (1) a fitness for employment, and (2) a capacity for using pleasure [*συχολή*, conceived as a time not for doing nothing, but for doing what you do not live by (*Pol.* 1338, A 10)]. It must, therefore, be utilitarian, but not mainly so; since what is liberal or noble is intrinsically good, and even what is useful has an effect on character which is more valuable than the external result—products or money. The means to be adopted are, first, the development of the body (*Pol.* 1338, B 5), which is to precede that of the mind; since it is impossible, says Aristotle, for the body and the mind to labour at the same period of life.

Up to the age of five, no demand must be made for study or labour, lest growth be impeded.

Movement must be allowed and promoted, since "the young cannot keep still"; and Plato is wrong in suggesting that children should not shout, for this helps their growth. During bodily growth, gymnastics must be gradually introduced, but it must be used with a careful avoidance of: (1) Lacedaemonian specialism in bodily development; and (2) severe or painful exercises in early years, for the purpose is the natural growth of all parts of the body. After the period of intellectual training is over, severe bodily training may be used. During the earlier period of education, besides bodily development, there should be acquirement of habit, which should precede the use of reasoning. Children must be made to like the right things, and must acquire tendencies in the right direction.

Aristotle, following Plato, implies an opposition to the moral scepticism as to which direction is right. It is of no importance for him that children should do what they like or what their teachers like, unless they like what they ought to like. This being supposed to have been decided, music is the most powerful means of instilling tendencies; partly because of the pleasure it affords [pleasure being an element in the good life (*Eth.* VII, 1152 B)], and partly because of the purification or purgation of spirit which is its result (*Pol.* 1341 B).

These principles are used (1) to distinguish the kinds of music to be used, some being said to have more direct moral, some more passionate or exciting, effects; (2) to decide as to instruments (the flute and the harp being condemned for different reasons); and (3) to prove that the children should be taught to perform as well as to listen. Aristotle refers to further details as given by philosophers trained in music.

The last stage in education, the training of mind by reasoning (*Pol.* 1338 B), is not dealt with by Aristotle, but is implied as the most important both in his ethical and social philosophy. As the moral virtues are developed by habituation and instilling tendencies, so the intellectual virtues are developed by reasoning. But, since education is to form the whole man, and since man is at his best in (1) that friendship which is the highest community in good (*Eth. Nic.* IX, 1169, B.S.G.); and (2) the intellectual perception wherein he is all but divine (*Eth. Nic.* X 1177, B), these are also implied in the Aristotelian idea of education.

In criticism, we may note that Aristotle's view is limited by the circumstances of the time.

(1) He makes no reference to the education of women or of craftsmen, although he hints that they may have to be considered.

(2) The importance assigned to gymnastics was largely due to its bearing on the military necessities of the time; for the πολίτης was a soldier, and a soldier then depended on agility and physical strength.

(3) The fear of social change impressed him with the importance of fitting education to society as established, and made him forget that society might be changed with respect to what is implied in education. It must be recognized that the Platonic-Aristotelian opposition to "revolution" was a reaction against the instability of Greek political life; it is due to their accidental circumstances and not to their general principles. Therefore, education is wrongly thought of by Aristotle as a force rather for permanence than for development in society.

(4) The simplification of all issues by the

hypothesis of a "parochial Sinai" in the *πόλις*, makes Aristotle's view of the administration or organizing of education obviously inapplicable to the modern social system and really inadequate even for the comparatively simple world of Hellas, in which both Plato and Aristotle shut their eyes to the fact that art and science had come from the contact of different peoples, and imagined a fantastically isolated and absolute city-state. These deficiencies, however, do not destroy the permanent value of the general principles expressed and explained by Aristotle. C. D. B.

ARITHMETIC, THE BEST MODES OF PRESENTATION OF.—Forty or fifty years ago, the teaching of arithmetic was of a stereotyped character throughout this country. Under the old *régime*, the children were first taught to count. No effort was made to give the children any clear understanding of the cardinal property of numbers; on the other hand, many teachers taught their pupils to label each finger so that, in the simple rules, they might have a ready and simple form of abacus. As soon as the children had learned to say the numerals by this method of repetition, they proceeded to learn addition of integers by counting. Addition sums were done until the child could add up large columns of figures, the only objective being to get the answer given. In the meantime, the multiplication tables were committed to memory and constantly rehearsed in a monotonous sing-song, a veritable *plainte éternelle*.

So we proceeded rule by rule, working each until the mechanical process involved could be carried out perfectly. No application of these rules was made until a much later stage, when the same method was pursued. The first reasoning necessary for the solution of any isolated question (say, in an examination paper) was to identify the rule under which it came; if the rule could not be identified, the question could not be solved.

The whole process can readily be seen by looking through one of the popular text-books of that time. Probably Dr. Davis's book had the widest sale. It consisted of figures from end to end, and questions involving the use of the English language were few and occurred mostly under "Rule of Three." Colenso's book was a revolt against the type, but the underlying principle remained, the only real difference being that each question was intended to supply the child with some item of useful information, such as the height of Cleopatra's needle.

No doubt the old method produced a considerable number of quite efficient arithmetical machines; no doubt, children of special ability won through, as they will under any system; but one is forced to the conclusion that most of the work was non-educative, and that the splendid opportunities offered by arithmetic for stimulating the child to think and for encouraging independent reasoning were practically wasted.

It should be our purpose to-day to get the greatest educational advantage from the subject for the greatest number. A good arithmetician must be, to a considerable extent, a machine; but he should be a thinking machine. On the other hand, it is not necessary or possible to make the average child more than quite a moderate arithmetician, but every child can derive great benefit from the subject if intelligently taught. The value of a

problem does not lie in getting the answer, but in the mental exercise which its solution provides.

The Infant. A sound course of arithmetic must be sound from the beginning. In this country it has been assumed that anyone can teach an infant; consequently, good teachers have been handicapped by having classes which contain the products of widely different types of teaching. The infant school teacher should be a carefully selected expert, for she has the most difficult teaching to do.

In the infant school, the teacher should impress on the children the meaning of the small cardinal numbers, so that they recognize a number as a specific property of a group of things in the same way as they recognize the blueness or redness of objects. Take, for example, the number *five*. At this stage its position as an ordinal is of small importance; on the other hand, the child should not only recognize immediately any group of five objects as a 5, but should be taught to arrange five objects in a group in various ways, so that it gets a clear mental vision of the simple properties of the group, such as "a group of two and a group of three make a group of five." So, too, with a group of six they should discover that it can be arranged in two equal groups of three, or two half-groups. This is quite a different thing from counting the objects in a group; the fingers on a hand would be a five group, if 5 was the only number recognized.

This mental perception of the elementary properties of the numbers 1 to 12 (say) is to be arrived at by allowing the infants to manipulate definite, named objects (bricks, marbles, tickets, etc.); such simple facts as are represented by $2 + 3 = 5$, $7 - 4 = 3$, $3 + 3 = 6$, or two threes = 6, will then be clearly and immediately perceived quite independently of any mechanical and unintelligent counting.

When such work is readily done by the infants *with objects in front of them*, the next step is to teach them to do without the objects and to picture them in the mind.

If the infants have thus a lively, active knowledge of the first ten or twelve integers, and the meaning of the half and quarter, combined with a general knowledge of the simplest everyday facts about such things as money, they are ready for a definite course of arithmetic planned on precise principles.

Second Period (7 years to 12 years). The second period occupies the time in a child's life which, on the average, extends from 7 to 12 years of age. It corresponds to the general elementary school, or to the preparatory (or junior) department of the secondary school.

Throughout this period all the numbers used should be of such magnitude that they can readily be understood by the children, and which experience will enable them to realize to the full. The numbers should refer to concrete objects with which the children are quite familiar. Abstract numbers should be avoided. The child can then apply all his powers to the reasoning process, and his mind is not distracted by having to deal with vague and unknown quantities. The word "number" does not mean simply whole numbers; from the beginning, simple fractions should be included, for there can be no doubt, for example, that a half is more familiar to, and more easily comprehended by, a child than, say, 97.

This fundamental principle suggests the method

of extending the syllabus. At each successive stage, the five processes of arithmetic—addition, subtraction, multiplication, division, and proportion—should be dealt with so far as the numbers included in the stage indicate and, at the same time, the essential "common-sense" can be developed. At each stage, the meaning of the larger numbers which are introduced should be made clear beyond doubt, and the notation (decimal and fractional) explained by means of many concrete instances.

These remarks will probably be made clear most easily by outlining the possible scope of the first two stages. The scheme is offered in no dictatorial spirit, but it may be claimed that it has been used successfully for several years.

(a) At the start of this stage, the child is familiar with the first ten integers and such simple fractions as $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$ (of course, in concrete instances, such as parts of a penny). These numbers supply amply sufficient means for the teacher to acquaint the children thoroughly with the meaning of the five simple rules. The work should be mainly oral (with the use of a blackboard); and we may say here that, throughout the second period, the oral work should predominate, although the proportion of written work should steadily increase.

The essential difference between the old and the modern method appears at once.

Such questions as—

(1) Charles has 2 pence; his father gives him 3 pence. How much has he now?

(2) Henry had 6 oranges; he gave William 2. How many had he left?

(3) A master gave each of four boys 2 good marks. How many good marks did he give altogether?

(4) A stick is 9 in. long. How many pieces, each 3 in. long, can you cut from it? How many pieces, each half an inch long, could you cut from one of the smaller pieces?

(5) If 3 marbles cost 2 pence, how much will 6 cost?

are within the ready comprehension of the children; they involve all the fundamental rules, and yet the child has to think, for there is no key-word such as add or subtract.

It is of prime importance in such questions that the simplest possible words should be used, and that the language should be free from any ambiguity, so that none of the mental energy is expended in the wrong direction.

The children should be taught to represent such simple questions symbolically—thus (i) $2 + 3 = 5$ —and the converse process is worth mentioning; for instance, the construction by the children of problems of which the symbolic representation (e.g., $15 \div 3 = 5$) is given. This is a good exercise in arithmetical common-sense and, if attention is paid to the form in which the child presents the problem, it is also a useful exercise in English.

Can there be any doubt that such questions are more suitable than the addition of six columns of abstract numbers? The teacher is given opportunities for using local and topical knowledge; he can supply all necessary information and explain new phrases by selecting his examples. The teacher should be careful to vary the subject of his queries, and to provide himself with the necessary topics.

(b) In the second stage, the whole numbers are extended to 100; fractions of a simple nature, such as four-fifths, are added; and, as a shorthand

method of writing tenths, the decimal notation may be used (*e.g.*, 1·4 in.).

The first necessity is to make clear the notation. Many methods are used; we have found the following useful, because it corresponds to ideas with which the children are familiar, such as changing a sixpenny piece for 6 pennies.

Differently coloured tickets (or sticks, beads, counters, etc.) are given values. Thus, a unit is represented by a white ticket, ten white tickets by a blue one, ten blue by a red. The child has, for instance, fifteen white tickets; these can be exchanged for 1 blue and 5 white, giving the notation 15. This method is also helpful in teaching the simple rules for larger numbers; *e.g.*—

(1) A boy has three packs containing 27, 34, and 47 white tickets; how many tickets has he altogether?

	Red.	Blue.	White.
1st packet .		2	7
2nd „ .		3	4
3rd „ .		4	7
	1	0	8

Result: 108 white tickets, represented by 1 red and 8 white.

(2) There are 5 classes in a boys' school; each class contains 27 boys. How many boys are there in the school?

Red	Blue.	White.	
	2	7	× 5
1	3	5	

Answer: a hundred and thirty-five boys; the number is represented by 1 red, 3 blue, and 5 white tickets.

At this stage, the multiplication tables become necessary. They should be constructed by the children and applied in such a way that they may be recognized as labour-saving. Then they must be memorized. They cannot be too readily known; and this point should be noted, because there is a tendency to neglect this part of the work. As the tables are learned, the inverse meaning should also be taught. Thus—

$$\begin{array}{l} 2 \times 2 = 4; \text{ half of } 4 = 2 \\ 2 \times 3 = 6; \text{ „ „ } 6 = 3 \end{array}$$

and so on.

So far as whole numbers are concerned, at the end of this stage the children should add and subtract mentally, without hesitation, any pair of numbers each less than 10; they should know thoroughly some of the multiplication tables, and have acquired a sound understanding of the notation and the underlying meaning of the simple rules.

The natural method of approaching numbers less than unity is by measuring, for the necessity for measurement created the necessity for fractions. At this stage, all the measurements should be lengths. Rulers graduated in inches, tenths, eighths, etc., on one side and in decimetres, centimetres, and millimetres on the other, furnish ample exercises in the use of fractions. It may be well to warn the teacher that no elaborate excursus into fractions and decimals is intended, and it is wise to avoid labels and mathematical expressions beyond the grasp of the child mind.

The better known units of money, weight, and length can be introduced in the oral examples;

the children should not be confused by unnecessary details, and the quantities used should not exceed amounts with which the children are familiar.

The method of development in the further stages should now be clear; ideas and methods taught at one stage are applied to larger and smaller numbers at the next; the incidental details of the subject are introduced as the magnitude of the numbers used at any stage indicate (*e.g.*, 1,760 yds. = 1 mile, when thousands have been taught). Practical measurements in British and metric units are freely used at every stage. It is most important that the necessary addition to the notation at each stage should be thoroughly explained; for this purpose, questions on the local value of digits in concrete instances are very useful (*e.g.*, 125 mm. = 1 dm. 2 cm. 5 mm.; or £32·4 are 3 ten-pound notes, 2 sovs., and 4 florins).

In the examples, problems should be the rule rather than the exception. *Ad hoc* exercises are necessary, and then in comparatively small groups only, when a new method of manipulating numbers has been taught (*e.g.*, the multiplication of numbers greater than 12). To fix a method after it is learned, the genetic method of instruction is useful, the whole class working out questions with the teacher.

One point should be carefully noted; the fact that 3 ft. = 1 yd. is a quite arbitrary equivalent, but 9 sq. ft. = 1 sq. yd. is a natural consequence of the former, and the deduction of this equivalent involves the fundamental idea of area. When a new idea, such as area, is introduced, it should be thoroughly explained; the value of the instruction given may be tested by seeing whether the children can deduce square measures from linear measures for themselves. The work should be all practical and no rules should be stated before the children have discovered them. Take an example: children can be taught the rule for finding the area of a rectangle and work out exercises without ever comprehending what they are measuring.

In this case, the teacher may start with a rectangle drawn on a squared blackboard, and let the class try to measure it in terms of a unit (*e.g.*, one square) shown on the board, in answer to some such question as: "How many pieces of paper, the size of a small square, will you need to cover up the rectangle?"

The necessity for sub-divisions of the unit area arises so soon as a rectangle has to be measured which does not contain a whole number of units. The children, if interested, will suggest methods of sub-division, and the new units which they suggest can be given simple names while the process is developed. A rectangle $1\frac{1}{2}$ units by 3 units, for instance, will require a new unit which is one-quarter of the given unit. The figure can then be divided into 3 rows of 6 new units, and its area is 18 units. The original unit must be recognized as 4 new units and the correct area found as $18 \div 4 = 4\frac{1}{2}$ units. This method, when several examples have been thrashed out, leads to the rule: $1\frac{1}{2} \times 3 = 4\frac{1}{2}$. It is in such cases that the heuristic method (*q.v.*) is of great value.

Third Period. In the secondary school or the senior department, the pupils are from twelve or thirteen years of age upwards. Having acquired during the second period a sound knowledge of the principles of arithmetic, they have now to learn (1) the longer and more difficult processes, in which the attention has to be confined mainly to number manipulation and to securing accuracy; and (2)

the technique of the subject, the importance of the various branches depending, to a large extent, on the probable future career of the average pupil.

Speed and accuracy are only attained by much practice, and are not necessary for the average pupil; but a good general knowledge of the subject which can be readily applied in the varied walks of life should be aimed at; special facility, such as that of a bank clerk, cannot be obtained during the crowded hours of school life. A good text-book is the chief essential at this period, and it is fortunate that there are several on the market.

We may, in conclusion, suggest some of the features which a good text-book should possess. In the more advanced work, it is an advantage to group similar matter; this does not mean a reversion to collections of arbitrarily chosen rules dealing with such arithmetical curios as races, games of skill, etc.; such rules and sets of exercises may well be abandoned. Widely various problems, which are, for example, cases of variation, may be grouped advantageously.

An important part of the work is the careful introduction of generalized or symbolical arithmetic, which leads to an appreciation of formulae and paves the way to a future study of algebra. The modern writer of an arithmetical text-book rightly includes an introduction to logarithms and practice in their use; this work should be arithmetical and should not be based on the theory of indices, with which pupils are not acquainted. Again, a course of elementary mensuration should be included: this provides interesting exercises, in which logarithms can be employed to save labour, and also introduces the pupils to ideas in plane and solid geometry.

It is further advisable that the work done in the more technical parts of arithmetic should agree with the actual practice in commercial life. For an example, the work done in stocks and shares in most text-books has no relation to practice: the examples are artificially constructed, are of no educational value, and worse than useless practically. Pupils who have worked through the book and its exercises cannot understand the table of quotations in the daily newspaper; such work should be based on the newspaper report. Similar remarks apply to most of the work which has appeared in text-books to answer the demands of examination papers.

A. C. J.

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ARITHMETIC IN ENGLAND, THE EARLIER TEACHING OF.—Arithmetic, in the Middle Ages, was one of the Seven Liberal Arts (*q.v.*). There was a mystical element in its teaching, which was traced back to Pythagoras, the first who brought it into an art. The leading principles were included in the encyclopaedical treatises of Boethius (A.D. 481-525), Cassiodorus (A.D. 468-569), and Isidore (*c.* A.D. 636). The allegorical treatise of Martianus Capella (in the earlier half of the fourth century), called the *Marriage of Philology and Mercury*, includes arithmetic. Some idea of the method of teaching arithmetic at the beginning of the ninth century may

be gathered from Alcuin's arithmetical propositions for Charles the Great (Sir A. F. West's *Alcuin*, p. 109 *et seqq.*). There is a full treatment of the English arithmetical writers and teachers between 1060 and 1599 by Professor Augustus de Morgan in the *British Almanac*, 1837 (p. 21 *et seqq.*) in the article "English Mathematical and Astronomical Writers." Mathematics especially benefited by the Moorish learning passed on to England through Spain; and, in England, showed itself chiefly at Merton College, Oxford. (See **RENAISSANCE**.)

The first English Renaissance writer on arithmetic was Cuthbert Tunstall, at first Bishop of London and afterwards Bishop of Durham. His *de Arte supputandi* was first printed by Pynson in 1522. In the University of Oxford, from *circa* 1408 to 1549, arithmetic was a subject for determination in arts, and the text-book was still the thousand-year-old Boethius. But, in 1549, King Edward VI's Statutes for Oxford substituted the text-books of Tunstall and Cardan, though attendance at the professor's lectures was voluntary. Tunstall's book, de Morgan says, is the "most classical which was ever written on the subject in Latin, both in purity of style and goodness of matter." It was dedicated to Sir Thomas More.

Up to the middle of the sixteenth century, arithmetic was only studied by few people in England. Cade says, in *King Henry VI*, "our forefathers had no other books but the score and the tally." The use of counters was another device, and the mode of reckoning by counters is fully explained in the first book written in English on arithmetic, entitled *The Ground of Artes* by Robert Recorde (*q.v.*), first published about 1540. Its later form, in which alone it is now extant, was a revised edition by the famous John Dee in 1561. Recorde insists on the antiquity of arithmetic in England, tracing its introduction into Britain to Dunwallo Molmutius, 2,000 years before Queen Elizabeth's reign.

Arithmetic in Private Schools. Arithmetic was not a subject in the ordinary school curriculum, in the sixteenth century, in England, nor, indeed, in the first half of the seventeenth century. Excepting in the most elementary form of numeration, it is not introduced by Brinsley (1612) as part of the grammar school course; and though it is mentioned by Charles Hoole, in his *New Discovery of the Old Art of keeping School*, yet he states that the grammar school does not teach the subject, and the boys must go to learn arithmetic and writing at a private writing school, Hoole specially mentioning Mr. James Hodder. Probably the earliest known of these writing and arithmetic private schools was that of Hugh Oldcastle, who appears to have taught arithmetic as early as 1543 in St. Olave's parish, Mark Lane, London. A little later, Humphrey Baker kept a similar school on the north side of the Royal Exchange, and in 1562 wrote his *Wellspring of Sciences*, an arithmetic text-book. Arithmetic was specially important for gentlemen's servants in their account keeping, and it seems that nobles often paid for the instruction of their servants in this useful subject. For a long time, gentlemen regarded arithmetic as a "vile" and "mechanic" subject, fit only for clerks and artisans, and not suitable for those who had coats of arms; but the sense of its usefulness triumphed, and the gentlemen actually sent their sons and even daughters to learn arithmetic at the private schools, so that they should be able to keep accounts

themselves. In 1564, and for twenty-five years onwards at least, John Mellis had such a school, and in 1607 his school was at Mayes Gate, near Battle Bridge, in St. Olave's parish, in Southwark, and he may well have been known to Shakespeare as a neighbour of the Globe Theatre. In 1650, John Kersey, one of the best known arithmeticians of the seventeenth century, was teaching arithmetic and higher mathematics in Charles Street, near the Piazza in Covent Garden; and in his prospectus, expresses willingness to attend at "the lodgings of such as are desirous." Edmund Verney, then 21 years of age, took lessons from him in 1657, receiving three lessons a week, and paying twenty shillings a month. "Arts and sciences are very dear" in London, he says. Other teachers of arithmetic were Henry Lyte, 1619; John Speidell, 1628, in Queen Street, London; Robert Hartwell, in 1636, in Fetter Lane; Noah Bridges at Putney, 1653.

In course of time, the learning of arithmetic was commended to women as well as men, to girls as well as boys. (For the grounds on which it was commended to women, see WOMEN, THE EDUCATION OF.) The most prominent advocate of arithmetic as a girls' subject, in the earlier part of the eighteenth century, probably was John Dilworth. (See WOMEN, THE EDUCATION OF.) "Girls ought to be put to the Writing School as early as boys, and continued as long" (*Schoolmaster's Assistant*, 1743.)

The Introduction of Arithmetic into Public Schools. The gradual introduction of arithmetic as a school subject may be traced in school orders and statutes. At Charterhouse, in 1627, masters were directed to teach the pupils "to cypher and cast accounts, especially those less capable of learning and fittest to be put to trades." In 1652, at Ashford Grammar School, Kent, Latin and Greek were to be taught without fee, but fees were to be paid for writing and arithmetic as extras. It was not, however, till 1673 that arithmetic was recognized thoroughly, and that only in one school, Christ's Hospital, which had the first mathematical department in an English public school, endowed by Robert Aldworth, under royal patronage. Though the names of Pepys, Sir Jonas Moore, Flamsteed and Halley, and Sir Isaac Newton are associated with its early history, it did not justify expectations. The origin of the inclusion of arithmetic in the curriculum goes back to the old private schools and their extension in secondary education—particularly to the schools brought into existence by Nonconformists after 1662. In primary education, the elements of numeration were included in Edmund Coote's *English Schoolmaster* (c. 1590), and arithmetic was first generally taught (long before it was taught in grammar schools) in the charity schools (see James Talbot's *Christian Schoolmaster*, 1707), where it is named as a subject for the fourth or highest class of the school—the other subjects being reading and writing.

F. W.

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ARITHMETIC, ORAL.—Oral Arithmetic, the title which has superseded the term "Mental Arithmetic," deals with exercises in calculation where the results are arrived at without making use of writing materials. Though the term "oral arithmetic" is a more apt description of the process involved than the term mental arithmetic, yet it is not wholly satisfactory, inasmuch as the statement of the exercises need not be communicated by word of mouth, and, indeed, in some cases is more usefully given through the medium of the eye.

In the earliest stages of the teaching of number, before the children have grown familiar with the meaning and use of symbols, it is obvious that all exercises and statements must be of an oral character; but, unfortunately, with an increasing familiarity with symbols, there grows up a tendency to abandon oral work, and to depend wholly on "figuring." Such a course brings with it special dangers. The symbols tend to become mere abstractions. Not only is there a regrettable loss of concreteness, but, through concentration on the manipulation of the figures, the real purpose of the problem is obscured; the focusing on points of detail causes the operator to lose sight of the main problem to which the details should properly converge, and the scholars in such cases unconcernedly hand in solutions which, with the merest general view, would have been recognized as absurd.

Aim of Teaching. The corrective for such a situation is to be found in holding a just balance between the claims of oral and written arithmetic.

But oral arithmetic can claim another great sphere of usefulness, since it is calculated to develop mental power and produce concentrated effort. The ability to judge of general relationships is sometimes familiarly referred to as the power of putting two and two together. A close study of dull children reveals the fact that usually their dullness consists in their inability to hold at the same time two things in their focus of consciousness. In endeavouring to grapple with a second idea, they let slip the first. Oral arithmetic, taken on systematic lines, helps very materially to overcome this defect. The first portion of a child's training should consist of oral exercises based on concrete concomitants, for his mental grasp requires something more stable than mere words. Starting with objects at hand, the teacher should pass on to symbolic groupings, and, lastly, to symbols.

Method of Teaching. The ability to deal with number relationships is usually of extremely slow growth; the teacher at the earlier stages should avoid any set attempt to "speed up" the efforts of his pupils. There are wide variations between the "rates of thinking" of different children; whenever they display evidence of honest efforts to solve the problems placed before them, the teacher should be satisfied. Speed is essentially the result of practice.

The skill of the teacher will be proved not only in the provision of a fair field for the slower children, but also in the suitability of the exercises for the class as a whole. No subject in the curriculum, perhaps, offers such opportunities for skilful questioning as oral arithmetic. First, the questions

should be framed with a definite end in view. They should aim at familiarizing the scholar with the terms and language constructions which he will meet in his later written work. They should provide well-graded sequences, the greater numbers being developed from the smaller, and complex ideas considered after the simpler ones have been dealt with, so that the pupils may acquire that sense of number which caused the Greeks to associate it with music. Number exercises, constructed on the principle of a chain, are in accord with mental processes, which operate through association. Again, the power of exposition is one of the most difficult in the whole range of language; the step-by-step development of oral arithmetic affords openings which cannot easily be secured in any other way.

The teacher will find much scope for skill in getting the rest of the class to examine faulty answers. There may have been a more or less natural misunderstanding of the question as stated, and the source of confusion may be traced by other members of the class. The error may have arisen through a contracted form of speech which was unknown to the child who gave the answer. The answer may have omitted something really vital to the specification of the solution, such as the dropping of the denominational element, which should properly have accompanied the numerical element.

Since talking on the part of teachers may readily run into excess, extensions of oral work may usefully be provided. Long and involved problems cannot profitably be given orally, yet they can frequently be dealt with effectively when written on the blackboard, and unravelled step by step.

Oral work can, moreover, be utilized to arrive at approximate answers to exercises set in written arithmetic, the pupils being first led to suggest more manageable numbers than those given in the problem, and to indicate useful relationships between the various parts of an exercise. They should also, at times, concentrate particularly on the language aspect, and substitute other words without altering the arithmetical conditions. Again, they should substitute analogous arithmetical work; this will often enable them to show their knowledge of goods bought and sold in a similar way, having prices resembling those given. When the answer has been obtained, it may, in its turn, be utilized for remodelling the problem, and the children may state a new problem which shall require as its answer what was originally one portion of the data.

A. J. B.

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ARMOUR INSTITUTE.—A school of technology in Chicago, founded by Philip Armour in 1892. Pupils are admitted by approved certificates from public schools and academies, and provided with a four years' course of training in engineering, to lead up to the B.Sc. degree granted by the Institute. Large workshops, a well-equipped laboratory, and an extensive library are provided, and there are also evening classes and correspondence courses.

ARMSTRONG COLLEGE, NEWCASTLE-ON-TYNE, THE.—This college, which forms an integral part of the University of Durham, was founded in 1871, as the Durham College of Science, and was afterwards re-named Armstrong College as a

memorial to the first Lord Armstrong, the eminent engineer. Extensions were made to the buildings in 1888, when the north-east wing was opened, and again in 1894; and King Edward VII opened the new west wing in 1906.

The original founders of the institution were the university authorities, aided by the landed gentry of the neighbouring counties and various influential associations: notably the North of England Institute of Mining and Mechanical Engineers. The declared aims of the college were the study of science, literature, philosophy, the fine arts, and, especially, science as applied to the mechanical arts; the most important work done is in engineering, mining, industrial instruction and research, and agriculture. Students who passed the prescribed examinations were made Associates in Physical Science of the University of Durham; degrees in science and literature are now granted. The literary department includes the usual arts courses in English literature, classics, modern languages, ancient and modern history, logic, mental and political philosophy, economics, and kindred studies; the department devoted to the fine arts has a good Life School in which instruction is given by many well-known artists from time to time.

The college is ruled by a board of governors, comprising donors of sums of £50 and upwards, annual subscribers of £5, executors of testators who bequeath legacies of £100 and upwards, and representatives of other benefactors, besides many *ex-officio* and representative governors, such as the Bishop of Durham, the Duke of Northumberland, other peers whose estates lie in the four counties of Northumberland, Durham, Westmorland, and Cumberland, M.P.'s, the Lord Mayor of Newcastle, and deputies sent by the County Council, the chief boroughs, the North of England Institute of Mining and Mechanical Engineers, the Chamber of Commerce, the Newcastle Literary and Philosophical Society, the Durham Coal Owners' Association, the Farmers' Club, the Tyne Shipbuilders' Association, the Northumberland Miners' Mutual Confident Association, etc. Each representative acts for twelve years.

Out of these the governors elect fifteen members to form the nucleus of a University Council, and these in their turn co-opt other governors to complete the body, which carries out the ordinary administration of the college. The president of the council is Viscount Grey of Falloden, K.G.; the principal of the college is Sir Theodore Morison, K.C.S.I., K.C.I.E., C.B.E., a distinguished Anglo-Indian.

The social life of the community is in the hands of the Undergraduates' Representative Council; there is also an Athletic Union. (See DURHAM, THE UNIVERSITY OF.)

ARMY, EDUCATION WITHIN THE.—Education in the Army as it came to be understood during the Great War is distinct from preparation for the Army. The provision of facilities for the general and vocational education of soldiers is indeed a new development which cannot be said to have attained any considerable momentum until the war was almost over. But few persons in authority realized in 1916 or even in 1917 that the conditions which obtain in a vast citizen army are not merely favourable for mental training, but imperatively demand that all men living in camp should be encouraged to secure it. Woolwich, Sandhurst, and other

military institutions still prepare cadets for their profession. Army schoolmasters (*q.v.*) still teach the boys enlisted for various services, and the children of married soldiers of the regular army. It has always been the practice to provide classes in farriery, saddlery and other useful crafts for men about to return to civil life; but the provision of lectures and class-work under a comprehensive scheme is an undertaking which had never before been called for.

A large proportion of the first contingent of Canadians was enrolled from the universities. They met in study-groups which were the forerunners of the "Khaki University" with its "College" in every camp. Very great credit belongs also to the Y.M.C.A., who early in the war arranged for lectures in their huts. Subsequently they instituted classes in a great variety of subjects such as French, the history and geography of Europe, the immediate antecedents of the war and the responsibility for it of the Central Powers. The Central Council of the Association displayed great enterprise in meeting all requests, and sound patriotism in fostering the demand for self-improvement. This department of their work grew rapidly, and soon reached dimensions which justified the Central Council in asking the universities to appoint representatives to undertake its management. In 1916 it was placed in the charge of the Y.M.C.A. Universities Committee, who were allowed a free hand in expenditure. (See Y.M.C.A., THE EDUCATIONAL WAR WORK OF THE.)

The Control of the War Office. Early in 1917 the War Office began to make provision for the education of young recruits at Brocton camp, one of the Reserve centres. Ten hours a week were set aside for instruction during parade hours, in literature (history, geography, composition); science and mathematics; ethics and hygiene. A much ampler scheme was adopted for the 23rd Army Corps (at that time the Southern Army) in the following November. In addition to regular classes in parade hours, voluntary evening classes were arranged in technical, industrial and commercial subjects; continuation classes in specialized and more advanced subjects; classes and lectures for intending teachers; classes on broad military subjects; lectures on various questions of the day.

In July, 1918, the Adult Education Committee appointed by the Ministry of Reconstruction reported in favour of the creation of an education branch of the War Office, under the direction of a specially qualified military officer of academic distinction and with educational experience. Such a department was set up in September by Army Order X, with Colonel Lord Gorell at its head. From the date of this order, Staff Directorate 8 has been responsible for education in the army; and there is little doubt but that it will prove to be a permanent element in military organization.

When S.D. 8 began to exercise its functions it was contemplated that it would have at its disposal large numbers of teachers from universities, technical colleges and schools; but the whole aspect of affairs was changed when the Armistice was signed. As soon as students began to return to their universities and colleges, the shortage of teachers at these institutions was acutely felt. The Board of Education moved the Army authorities to treat all teachers as pivotal men. An extremely difficult situation was then created. The numbers

for whom education was to be provided were immense. Their needs were as varied as their occupations. They covered the whole field occupied in peace-time by universities, technical institutes and secondary schools. There was even a residuum of illiterates—men from the Newfoundland fisheries and lumber camps, for example, who had never been within reach of a school, and other wanderers who had forgotten almost all that they had learned in the elementary schools in the home-land.

Teachers. An army of teachers would be required to provide for the mental needs of all these varied classes of students. Under the War Office scheme an education officer was to be selected for every command, camp and unit. An establishment of instructors was to be allowed on the scale of four officer-teachers and twelve non-commissioned officers for every 1,000 men. There was but one way of meeting this almost impossible situation—the provision of schools in which promising men should receive a short course of intensive training as army teachers. For this purpose schools were established at Cambridge and at Oxford from which teachers were sent out to the various commands, after about a month's preparation for their duties. Such a scheme can only be described as a very hasty improvisation to meet a sudden and imperious demand. On the whole it met the demand with more success than might have been expected, thanks to the zeal and efficiency of the instructors in these two army schools, and the admirable spirit which their pupils displayed.

The Army a Seed-ground of Knowledge. There can be no question but that the Army is a favourable seed-ground of knowledge. The difficulties which beset an attempt to turn all soldiers into students, in the absence of a sufficient supply of teachers, or an adequate provision of the appliances needed in teaching are sufficiently obvious; otherwise the conditions under which the attempt was made were favourable. Men accustomed to the seclusion of their homes find themselves, after the first novelty of "joining up" has worn off, living a social life in which privacy is unknown. The routine of camp affords scant material for conversation. Yet the common life inspires every man with a desire to assert his individuality. He experiences in the crowd a desire to realize his own personality. Whatever his rank some or other of the men with whom he associates know more than he knows, or, at any rate know many things of which he is ignorant. If he be not lazy or sullen, he feels that he must make an effort to hold his own. Self-esteem prompts him to improve himself, to increase the range and depth of his knowledge. In a word, camp life supplies an incentive to self development.

Not from the psychological side alone does the Army afford an opportunity for adult education. The merely mechanical conditions are more nearly suitable than those of civil life. In civil life even those whose minds are exceptionally alert find that, after a day's work, they are disinclined to leave the fireside or to make their way to a lecture hall or a classroom at a considerable distance from their homes. In camp the classroom is as accessible as the canteen. In civil life many places of amusement, meetings of clubs, social gatherings are rivals of intellectual occupations. In camp the opportunities of securing entertainment during leisure hours are more limited.

Subjects Taught. The selection of subjects in which courses are practicable presents an exceedingly

difficult problem. The provision of appliances on so vast and unprecedented a scale is almost as difficult to arrange as the supply of teachers. If choice were unfettered, scientific and technological subjects would probably prove most popular. But subjects such as chemistry, physics, mechanical engineering are ruled out, except on a comparatively humble scale. Properly equipped laboratories accommodate but a very limited number of students at any one time. It is out of the question to provide an adequate equipment for hundreds of thousands of men. Workshop arithmetic is a useful subject, and fairly popular. Much success has attended the teaching of machine drawing. Beautiful work was produced by men who had had no previous experience of the subject; and apart altogether from its application to trade purposes, the practice of accurate drawing was both useful and enjoyable. Even on the commercial side it was impossible to meet all the wishes of the men. There was a great demand for typewriting; but few machines were available. Shorthand, accounting, commercial law, the principles of banking, exchange and transport and similar subjects are easily provided for. Agriculture, the growing of flowers and vegetables, bee-keeping, and poultry keeping can be taught with success, if the best is made of the opportunities afforded by the camp and its surroundings. In the overwhelming preoccupation of the war, but little was done. A good many experiments were in progress at the time of the Armistice. Had the war lasted through another winter some measure of success in the teaching of these subjects would probably have been attained.

The privileges and duties of citizenship, the history, geography and products of the Empire and the distribution of British resources, leading naturally to the science of economics are subjects of paramount importance. These subjects were treated in series of lectures and classes lasting over three or four months. So long as the supply of competent teachers was adequate to meet the demand, they aroused keen interest; but as the numbers of men under instruction increased, it became necessary to train teachers in these subjects, providing them with syllabuses and notes; and it must be confessed that second-hand instruction of this kind conveys but a feeble echo of the challenge of a teacher who has made the Empire his chief interest, has seen various parts of it with his own eyes, and has acquired as a teacher within a university, or as a university extension lecturer, the art of summoning the attention of his audience.

The scheme of education which was planned for the Army during the summer and autumn of 1918 cannot be said to have come into operation, except in small parts. As fast as the machinery was constructed the material upon which it was to work faded away. Education of an army in being gave way to education preparatory to demobilization, with the exception (and it is a very important exception) of the instruction of the lads of 18 enlisted shortly before the signing of the terms of the Armistice. A large amount of experience was gained which would be of great value in the future in the event of a general mobilization of the manhood of the Empire. It is most earnestly to be hoped that the records of this experience will never have any but a historical interest.

A. HILL.

ARMY SCHOOLMASTER. — (See ARMY TEACHERS.)

ARMY SCHOOLMISTRESS. — (See ARMY TEACHERS.)

ARMY TEACHERS.—Before the Great War, three avenues of approach to the position of Army schoolmaster were available. Either a boy might become a pupil teacher in an Army school, and gain a place, by competitive examination, as a student in one of the three military schools which discharge the functions of a training college; or he might join the Army, rise to the rank of corporal or higher, and gain a first-class certificate of education, and, having an unexceptionable character, secure the recommendation of his commanding officer, or he might qualify as a certificated teacher in the United Kingdom.

If he adopted the third course, he must have been trained at a training college if his certificate was granted by the Irish Commissioners; in any other case, training at a training college was a recommendation, though not a necessity. He had to possess a certificate of Scripture knowledge, and be able to teach singing. No applicant who did not possess a speed certificate in Pitman's Shorthand was accepted. A sufficiently qualified candidate, on passing a medical examination and being accepted, served a year on probation. At the end of the year he had to pass an examination in those elements of special knowledge which an Army schoolmaster must have.

The work of Army schoolmasters was to instruct the children of soldiers who were married and "on the strength" of their regiments, and also to instruct soldiers who desired to obtain certificates of education to qualify themselves for promotion.

This work is continued under the new Army Education Scheme, which has developed out of an Education Scheme brought into operation in 1918. The new scheme involves the formation of an Army Education Corps, which will absorb the Army schoolmasters and provide further facilities for all ranks in the Army to continue their education up to university standards.

The pay of Army schoolmasters is better than that of certified assistant teachers. The difference is intended to compensate for the necessity of going to any part of the Empire where troops may be sent. Under the new scheme the pay of officers and other ranks employed in the Corps will be approximately equal to that of staff or regimental officers and warrant officers, according to the appointment held.

Army Schoolmistress. The Army, being independent of the ordinary provision of schools, naturally needs women teachers for the instruction of infants and elder girls. These women teachers are actually trained by the Army authorities, and pass through the stage of pupil-teachership, and sometimes that of acting schoolmistress or assistant teacher. Some Army schoolmistresses may be recruited from the ranks of qualified civilian teachers.

An Army schoolmistress may be required to serve in any part of the world. She is liable to retirement on marriage, but may still be allowed to retain her position, in which case she is not required to live in barracks unless married to a soldier quartered there.

The pay of a certificated Army schoolmistress is equivalent to about £132 10s. a year, rising to a possible maximum of £232 10s. a year, with quarters and medical attendance at all times. The

additional pay of head mistresses is £12 to £24 per annum. A. C. C.

ARNDT, ERNST MORITZ (1769–1860).—He was the son of an emancipated serf, and was educated at Greifswald and Jena in preparation for the ministry. Refusing to enter the Church, he travelled for some years, and in 1805 became Professor of History at Greifswald and, in later years, at Bonn. He wrote a history of serfdom, which brought about its abolition in Pomerania. He was active from 1806 in rousing the Germans to throw off Napoleon's yoke, and wrote vigorous patriotic songs and pamphlets to quicken their patriotism.

ARNOLD, MATTHEW (1822–1888).—The eldest son of Arnold of Rugby, born at Laleham, in Middlesex, and educated at Winchester, Rugby, and Balliol College (Oxford). In 1840 he gained the Rugby Prize for his poem *Alaric at Rome*. From 1847 to 1851 he was private secretary to Lord Lansdowne, who appointed him the first Lay Inspector of Schools. In 1852 he wrote *Empedocles on Etna* in dramatic form; and in 1853 and 1855 published volumes of poems, which created a good impression and led to his appointment as Professor of Poetry at Oxford (1857–1867). *Essays in Criticism* appeared in two series in 1835 and 1888; and between 1869 and 1885 he wrote many essays, giving his views on religious and controversial subjects. Many poems were written during these years, including the well-known *Forsaken Merman*, *The Scholar Gypsy*, and *Sohrab and Rustum*.

Arnold was employed by the Government in several inquiries into education. In 1859 he was appointed by the Duke of Newcastle's Commission to inquire into the state of popular education in England. In 1865 the Schools Inquiry Commission appointed him to report on Secondary Education in England and Wales. In 1885 he was sent on a tour of inquiry into Germany, Switzerland, and France in regard to free education, the quality of education, the status, training and pensions of teachers, compulsory attendance, and release from school. His reports did much to shape the course of educational legislation and departmental orders in this country.

Government Reports. While Arnold was Inspector of Schools, his reports (1852–1882) provided valuable criticism of all the work that was being done in connection with elementary education, with statements of his own views and suggestions for improvements. The Reports provide a most instructive history of elementary education during the thirty years of Arnold's inspectorship, and the greater part of his suggestions have since been carried out by the Board of Education. The Reports were published in 1909, and were at once prescribed by the Board of Education as a subject of study for candidates for the Teacher's Certificate. Arnold disapproved of the change in 1870 from class examination to standard and individual examination. He held that the new system afforded no examination of the life of a class, of the fitness of its composition, or of its handling by the teacher, and that this examination made no call on an inspector's spirit and inventiveness. He attached great importance to reading books being of a real literary nature and calculated to form a good taste. He also urged the value of learning by heart, if the sense was also thoroughly learnt; and of grammar as a mental discipline. Like his father,

he was not disposed to press the teaching of science, nor did he attach much value to the scientific study of the theory of education. Practical application he considered the best test: "The teacher should open his soul, and will open the soul and imagination of the children the better, the more he has opened his own." Arnold urged young teachers to devote more time to thought and literary culture, and advocated their taking up graduates' courses at the London University. As an inspector, Arnold showed no harshness or want of sympathy with teachers. He fully recognized their work, their devotion, and their sincerity; but he held it to be his duty as inspector to expose any fault he discovered in system, school, or teacher.

ARNOLD, THOMAS.—Dr. Arnold, the headmaster of Rugby, was born at Cowes in 1795. He was brought up amidst the bustle of soldiers and sailors, and in one of the most stirring periods of English history. His interest in the Napoleonic wars and Wellington's campaigns roused in Arnold a taste for histories, and he read with delight the wars of Greece and Rome. From early childhood, he was a great reader, and was especially fond of Homer and of historical ballads. In 1807 he was sent to Winchester, and in 1811 entered Corpus Christi College, Oxford, as a scholar. He was elected a Fellow of his college in 1815, and gained the Chancellor's prizes for Latin and English essays in 1815 and 1817.

Arnold was ordained in 1818, but never took office in the Church but settled at Laleham, near Staines, to prepare private pupils for the University. He married in 1820, and lived for several years at Laleham, developing his power of teaching and his interest in history. His study of Niebuhr's *History of Rome* did much towards forming his own historical views, and his own *History of Rome* was published in three volumes between 1838 and 1843. In 1828 he was appointed headmaster of Rugby at a time when the school occupied a very lowly position among public schools. Arnold occupied this position for fourteen years, also working at his *History of Rome*; and spending his vacations, after 1832, on his small estate near Ambleside. Lord Melbourne, in 1841, appointed him Regius Professor of Modern History, and he gave some lectures, intending shortly to retire from Rugby and to devote all his energies to his professorship. But just before the school summer vacation of 1842, he was seized with angina pectoris, and died within a few days. He was buried in Rugby Chapel.

As a thinker and a student of philosophy, Arnold was, by deep conviction, an Aristotelian. He "sought to make speculative enquiry subservient to the solution of practical problems" (Fitch). He considered Aristotle the best guide to the right methods of study, and his fondness for that philosopher caused him to send his own sons to Oxford because Aristotle was held in greater esteem there than at Cambridge. His own attitude towards matters of belief was one of inquiring doubt combined with a desire to see the truth clearly.

As a head master, his methods were characterized by firmness and skill, with which he created a healthy tone in the school. Rugby, under Arnold, became a model of what a public school should be; and readers of *Tom Brown's School Days* may see the power of such a master's influence on the moral and religious feelings of boys and young men at an

age when character is being moulded. When obliged to expel some boys, he said that it was not necessary to have a school of many boys, but it was necessary to have a school of Christian gentlemen. His "Christian gentlemen" were not to be limited to the boys of the school, but were to form the whole church and the whole nation, so that the Christian Church and the Christian people should be one and the same.

Educational Aims and Methods. When Arnold became headmaster of Rugby, he took up education seriously; he was more concerned to put new life and meaning into existing methods than to introduce new ones. His aim was to inspire his pupils with enthusiasm, and he was enabled to do this by his clear insight into their intellectual needs.

His method was Socratic, and he relied on questioning to awaken interest. Generally, he gave no information except as a reward for an answer, and he made his explanations as short as possible. His questions and his explanations always called attention to the real point of every subject. He did not expect the younger boys to understand all that they were taught; but as they advanced in knowledge, he trained them in habits of collecting facts for themselves and of understanding the principles on which the facts were based. He said: "You come here not to read, but to learn *how* to read." Arnold's own enthusiasm for his own favourite studies was infectious. The early letters of his young pupil, Arthur Stanley (afterwards Dean Stanley), express his delight at "being taken" by the Doctor and at hearing the Doctor's own lectures. What was excellent in Arnold's method lay rather in the man and the spirit of his teaching than in the form of the rules and systems.

Arnold's ideals were at variance with those of Herbert Spencer, who when he asks, "What knowledge is most worth?" answers his question and proves to his own satisfaction that "science" is most worth. Arnold put history before science, of which little or none was taught at Rugby. The curriculum consisted of languages, with history, geography, divinity, ethical and political science. "In his teaching of languages, he was the first master of a public school to draw attention to the historical, political, and philosophical value of philology and of the ancient writers, as distinguished from the mere verbal criticism and elegant scholarship of the preceding century" (Fitch). Among subjects other than languages, history was foremost; and Arnold considered the greatest lessons to be learnt from history were the laws of political science, and the highest aim of the student of history should be the desire to enter into the life of the nation and to take a share in its government.

To carry out his work, it was necessary that Arnold should be supported by masters imbued with his own spirit; and he was always careful to surround himself with men worthy of his confidence, and to trust them. He felt that the headmaster and his staff must be "an organized community for mutual help in the business both of teaching and of learning." His own views are best expressed in his own words referring to what he looked for in an assistant-master: "I want a man who is a Christian and a gentleman, an active man, and one who has common-sense and who understands boys. I do not care so much for scholarship—and yet I think I do, for even the elements are best taught by a man who has a thorough knowledge of the matter—I prefer activity of mind, and an

interest in his work, to high scholarship, for the one can be acquired more easily than the other."

Arnold's contributions to literature are his unfinished *History of Rome*, six volumes of sermons, an edition of *Thucydides*, and his few Lectures on Modern History. Indirectly, his influence on literature was great; "few schools have contributed to it in the same time a greater number of famous writers than Rugby did under his headmastership" (Prof. Saintsbury). The best account of Arnold is to be found in *Life and Correspondence of Arnold*, by Dean Stanley; while Sir. J. Fitch's volume on the two Arnolds is a valuable guide to a knowledge of the influence of Thomas Arnold and his son, Matthew, on English education.

ARNSIDE SUMMER SCHOOL.—(See CO-OPERATIVE MOVEMENT AND EDUCATION, THE.)

ARRESTED DEVELOPMENT.—This term is used in the strict sense as descriptive of the prenatal arrest of changes in the embryo, as a result of which the child after birth is an idiot, an imbecile, or mentally deficient. The term, however, from the point of view of education, is applied in a different sense to describe the mental state of the child who, owing to congenital weakness, malnutrition, or some other more obscure cause, is backward (*i.e.*, he fails to reach the normal stage of development for his age).

Arrested development in this sense is largely curable by educative methods. The backward child shows definite characteristics, a fact which may aid in determining the causes of such arrested development, *e.g.*, a sluggish disposition, intractability, nervousness, proneness to fidget, incapacity for application or voluntary attention. Various physical concomitants are often found in connection with backwardness, *e.g.*, malnutrition, anaemia, and adenoids. At the same time, the cause of the arrested development may vary, and can only be discovered by careful investigation. Much of the mental attitude of the backward child is due to there being little co-ordination between the chief brain centres, owing to the slow development of the association tracts. Many children also are unable to realize abstract ideas, as their power of imagination is weak. The cure for backwardness can only be found in discovering by educative methods the cause of the arrested development and, by careful experiment and training, giving the brain a definite bias along the lines in which it is deficient.

M. J. R.

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ART EDUCATION AND INDUSTRY.—Down to the latter days of the eighteenth and the early days of the nineteenth century, education pertaining to such arts as were associated with industry was obtained in this country by means of the apprenticeship system and through tradition. Each generation instructed the succeeding one in the knowledge that that generation had acquired. In so vast a field, the worth of these traditional methods is not easy to realize; a little may be learned from our historic buildings, and from such unique storehouses of industrial art as the Victoria and Albert Museum; but, valuable as these are, they can only touch the fringe of the art and industrial achievement that must have been accomplished through these means.

Endeavours were made during the second half of the eighteenth century by the Board of Trustees for the encouragement of manufactures in Scotland, by the Dublin Society, and by the Royal Society of Arts, London, to promote the association of art education with industry. The two former societies established schools of drawing, which, later, acquired a considerable reputation. These, combined with other schools of these metropolitan cities, are represented to-day by the College of Art, Edinburgh; and the Metropolitan School of Art, Dublin. The Society of Arts offered premiums for good drawing, and it still continues to support the same ideals. In addition to the Drawing School at Edinburgh, a branch school was established at Dumfermline, to promote instruction in pattern drawing for its linen industry. This endeavour failed to receive continued local support, and was soon discontinued. With these exceptions, such instruction as was obtainable early in the nineteenth century in art for industrial purposes, was entirely due to private initiative.

Mechanics' Institutes. The rapid industrial developments that began with the conclusion of the Napoleonic Wars, and the larger and more complex problems placed thereby before workers, raised a demand for further education, which resulted in the establishment of numerous Mechanics' Institutes. The suggestive title of these explains their character: they aimed to give instruction primarily in rudimentary science, and to make good defects in the general education of artisans. The demands of the localities, however, in which some of these schools were situated led, at an early period in their career, to the establishment within their walls of classes in drawing. In London alone, in 1835, there were some thirteen Mechanics' Institutes, all offering instruction in this subject. At this time, the range of study available for artisans at the London Mechanics' Institutes was confined to geometrical and mechanical drawing, ornament and figure drawing.

Through the advocacy of Benjamin R. Haydon and others, a Select Parliamentary Committee was appointed in 1835 to inquire, *inter alia*, "into the best means of extending a knowledge of the Arts, and of the principles of Design among the people (especially the manufacturing population) of this country." The evidence submitted tended to show that the art instruction available was inadequate to the requirements of the industrial population, that knowledge of Design for industry and manufactures was little understood, and that our products in both the home and foreign markets suffered in comparison with the more refined French products. The Report of this Committee says: "The ardour for information is apparent in Birmingham, Sheffield, and London; and the manufacturing workmen in the neighbourhood of Coventry have (to their great honour) specifically petitioned the House of Commons for instruction in Design. . . . The more matured Mechanics' Institutes have disseminated much valuable instruction in the Arts. The Reports of the Mechanics' Institutes of Glasgow, Manchester, and Coventry indicate the awakened attention of the inhabitants of those towns to the importance of education in Design."

Normal School of Design. This report may be regarded as marking an epoch; it heralded the establishment of organized instruction in industrial art. In 1837 a Normal School of Design was established by the Board of Trade at Somerset

House to train designers for industry, and to further the direct application of arts to manufactures. Three years later, aided by further Government grants, steps were taken to establish daughter schools in some of the larger provincial towns, which were the seats of industries likely to make use of the opportunities offered to them. The avowed aim of applying arts to manufacture does not appear to have attained any success through these early efforts. In the parent school, much reconstruction followed on the first foundation; those associated with the movement scarcely appear to have realized that the unprepared state of the community would render it very unlikely that the advantage offered could be utilized. Several inquiries were held during the succeeding years.

In 1847 it was laid down "that instruction in daughter schools should be assimilated with that of the head school." Later, it was shown that progress was generally hampered through debt, but that, nevertheless, progress had been made; and that "it might be safely assumed that the 15,000 or 16,000 pupils who had passed through the schools had exercised a beneficial influence on manufacture." It had, however, to be admitted that foreign design was yet copied and adapted in our industries.

In 1850, there were some twenty schools in Great Britain and Ireland, besides the school at Somerset House; the subsidy received through taxation was approximately £10,000, of which £3,500 was expended on the Government school and an auxiliary, associated female school. The administration of the schools—apart from the head school—devolved on local committees; and financial equilibrium was, as far as possible, maintained through local subscriptions, fees received, and Government grants.

The Great Exhibition of 1851 illustrated to discerning minds that, in spite of educational endeavours, a great gap still existed between taste and design on the one hand, and the products of our industries on the other. For the schools already established, it was the parting of the ways—not as regards further association with industry, but for the fundamental changes in organization outlined a year later. The schools were to be designated "Schools of Practical Art," and it was contemplated to establish a new department of the Board of Trade to watch over them. The special objective of the schools was defined in one of the Board's Minutes as: (1) The promotion of elementary instruction in drawing and modelling; (2) special instruction in the knowledge and practice of ornamental art; and (3) the practical application of such knowledge to the improvement of manufacture. During the next year the administration was merged in a new department—that of Science and Art—attached to the Committee of the Privy Council on Education. At this time, the control of the central authority was modified as to the establishment of schools of practical art, so that any town might establish such an institution, provided that certain conditions were complied with. Under the Science and Art Department, the word "practical" disappeared from the title of the schools.

The procedure at this period suggests that sufficient experience had now been gained for the work to be continued under less experimental conditions. The range of study had been divided into stages and, except for modifications introduced through the recommendations of a Select Parliamentary

Committee in 1864, and for alterations in details, the methods and organization remained unaltered for years.

Whilst unanimity was scarcely to be expected in a subject that admits of so many diverse *views*, the evidence tendered to the Committee of 1864 was favourable, and a proof that steady improvement had been gradually brought about. The report re-affirmed the original conception that the study of decorative arts useful to manufactures was the primary object to be achieved; and recommended the circulation throughout the kingdom of examples from the South Kensington—now the Victoria and Albert—Museum.

The statistics of 1863 showed that there were ninety-two schools of art then established, and that 15,788 students had been in attendance during the year. At the same time, there were, at the National Art Training School, South Kensington, sixty-five students in training to become teachers and 540 paying students. This school was the successor of the one originally established at Somerset House, and eventually it became, in 1896, the Royal College of Art.

The wider scope which now characterized the administration of schools of art, and the desire for their co-operation in other directions besides that of industry, had far-reaching results; and during the forty years subsequent to 1865, the effects were greater, perhaps, in education, and in the creation of public taste, than in promoting the arts associated with industrial pursuits. The re-establishment, however, of a scheme of national scholarships in 1863, tenable at the National Art Training School, gave again to this school something of the character originally contemplated. The ideal was to make provision "for advanced students of schools of art who might give evidence of a special aptitude in design, and who were, or intended becoming, designers for manufactures." Such a scheme of scholarships was established in the original school at Somerset House and afterwards withdrawn. This class of award still continues, and is, if rightly used, one that will always confer enduring benefits on our national industries. One of the subsidiary changes of the period just described provided that night classes, specially adapted to the needs of artisans, should develop into art classes capable of being held during short periods of each week at any time of the day, as well as in the evening, and in premises not wholly devoted to art instruction. These classes were available in towns where the establishment of a school of art, with its more complete curriculum and special premises, would scarcely have been appropriate.

The South Kensington Museum also arranged to distribute to schools of art, through a Circulation Department, "objects collected with a view to illustrating the history, theory, and practical application of decorative art." Subsequently, grants in aid were made to schools and local museums for the purchase of historic objects of industrial art.

Some light was thrown on the much less tangible question of the effects of school of art study by means of the International Health Exhibition held in London in 1884. In connection with that exhibition, it was decided that, as no comprehensive public display of work, showing how far art instruction under review had been effective, had taken place since 1858, an exhibition of manufactures,

decorations, and design—the work of students who were or had been in the schools—should be held. A catalogue of the exhibits, and an account of the growth of Schools of Art was issued by the Council of the International Health Exhibition, in conjunction with the Council of the Society of Arts. At this date, the number of schools of art had increased to 177, and the number of pupils in attendance was nearly 34,000.

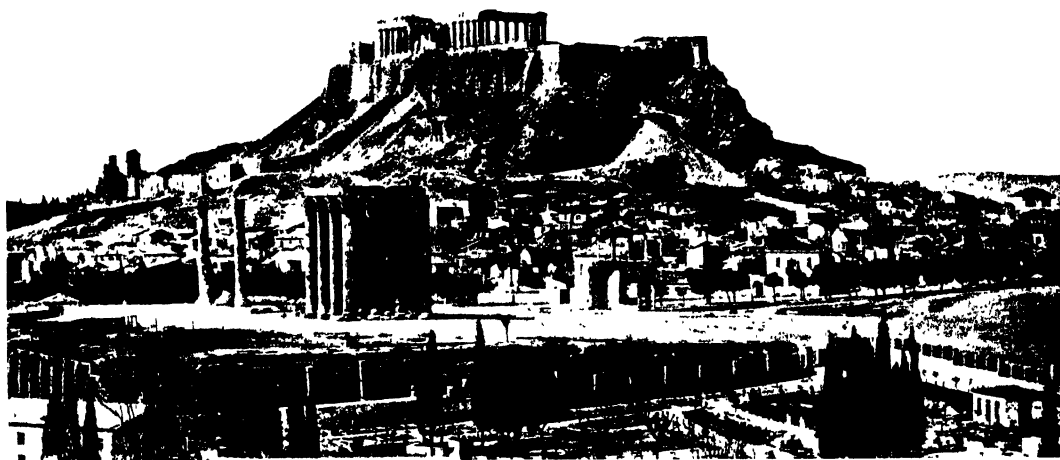
Art School Curricula. Government support had mainly tended to limit the range of school of art studies to drawing, painting, modelling, and designing. The success, however, attendant on the practical research of William Morris into many industries which had great, but practically dormant, artistic traditions, enlarged the conception of the scope of study in schools of art. His achievements as a producer of beautiful commodities, and his utterances and writings on industrial art, emphasized this view. Further, the general lack of facilities for acquiring information on the technics of all our industries began to produce demands for an education that had its roots more definitely fixed in the actual practices of manufacture. It was urged that good design was really only a part of good workmanship; and that where separated, as in the schools of art, from the means of reproduction, false ideals became established and uneconomical results followed. It was further pointed out that the sub-division of workshop practices necessitated the provision of instruction in those branches of manipulation for which the extreme specialization now prevailing gave no opening.

It is of historical interest that the Report of the Committee of 1835, which led to the establishment of these schools, recommended this unity of purpose; and, further, that four years later, William Dyce, R.A., laid down certain principles now universally endorsed, namely, that provision for the study of manufacture was indispensable, and that instruction in industrial processes must form part of the curriculum.

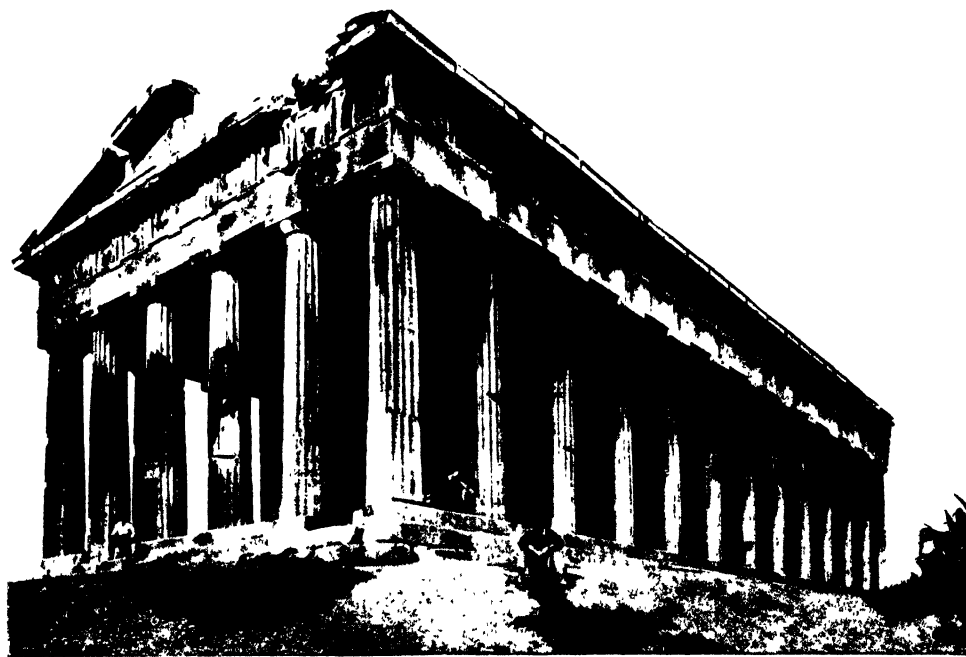
At this stage, control by local managers was steadily giving way to the exercise of full control, including that of finance, by Local Education Authorities; that is to say, the County or County Borough Councils in whose area the schools were situated. And, though the proper authority for London established, within the years 1897-9, two new schools, described as schools of arts and crafts, to deal technically with the problem, provincial schools and those in Scotland and Ireland gradually shaped their courses to respond to the new demands.

Art and Trade Requirements. It is now the general practice of all schools to give instruction in drawing, painting, modelling, design, and ornamental and decorative art; and in the large centres of population also to provide instruction in the fine arts. But the technical specialization in the schools of art as applied to local manufactures—such as Nottingham to the lace industry, Sheffield to the plate industry, Kidderminster to carpet manufacture, Bradford to weaving, etc.—has been almost entirely reserved for solution to quite recent years.

The extent to which schools can respond to trade requirements must depend on their locality. Thus, a school in the Potteries has an obvious service to perform. On the other hand, with the exception of the subjects already mentioned, the possible service of a school situated in a seaside town is perhaps not so readily demonstrated; but,



Athens. The Acropolis and Parthenon (Temple of Athena)



*Athens. The Theseum, or Temple of Thesus, The Mythical Hero of Attica,
who slew the Minotaur*

even in such a case, draughtsmanship for photography, lettering, typography, or decorators' work may come within the domain of practical realization. It follows that there must be wide divergence in character in these widely scattered schools. A complete collaboration of art schools with industry and manufacture is by no means easy to bring about. In this country, manufacturers are not infrequently antagonistic, and often, when favourably inclined, consider that their workshops would be seriously deranged by the periodical absence of their junior employees. Consultative committees, consisting of employers, employees, and art workers have been established in London and the provinces. The representatives of industry have been invited to take a greater interest in the promotion of a more intimate association between the educational agencies and the workshops. By these means, confidence is begotten and influences are brought to bear on the efforts of schools, which must insure their energies being always kept in correct channels. Side by side with the ordinary day art school work, which in the bigger schools is mainly of a vocational character, and which in the evening is almost entirely supplementary to an existing employment, there has grown up during the last few years a limited number of part-time day classes for apprentices, conducted wholly or in part during the time of the employers. The industrial ideals of these classes are probably the same, but their administration and the means of conducting them vary considerably. For instance, in one school, scholastic instruction with a bias towards the industry concerned may form part of the course, and, in another, practical instruction may be omitted and study confined to ancillary subjects. Types of this work may be seen at the Camberwell and Central Schools of Arts and Crafts; at the Edinburgh College of Art; and at the Leicester and Birmingham (Vittoria St.) Schools of Art.

Another form of co-operation between industry and art education, which should result in a larger and ampler sphere of service, may arise through day trade schools, called by the Board of Education "Junior Technical Schools." As the name denotes, these schools have been projected for the benefit of industries having a scientific basis, but the underlying principle is equally applicable to all industries which rely for their success on design and draughtsmanship. Schools of this character, taking boys and girls at 13 or 14 years of age for two or three-year courses, prior to their entering upon industrial pursuits, have much to recommend them, particularly as the scholastic portion of the course is gradually merged into the subsequent vocation without break of continuity. Schools of Art have already organized work under these regulations. At the Central School of Arts and Crafts, London, there is such a school for the composite subjects of printing and bookbinding; whilst at another Metropolitan art school further developments are in contemplation. In the schools of art in Birmingham (Margaret St.) and Leicester, under different conditions, boys are taken through day courses prior to seeking employment.

The official attitude of the Board of Education, as set forth in Circulars 775 and 897, can leave no doubt as to the function it is desired the schools shall discharge in the future. The official policy in the past cannot be regarded as faultless: it has been somnolent; it allowed the purpose originally contemplated to be almost forgotten for years.

The advance made by Germany—as revealed by a little "war" exhibition at the Goldsmiths' Company Hall, and a more recent exhibition of British goods held at the Agricultural Hall, London, in May, 1915, both under the auspices of the Board of Trade, has once more focused attention on the problems of art in association with education and industry. With the latter exhibition was associated a small collection of British designs and other experimental products, many of which came from schools of art. These exhibitions showed conclusively that, in Germany, a much closer connection existed between these constituents, that there was a larger and more venturesome response to new ideas; whilst the commercial aspect was kept steadily in view. It was felt by many that, if closer co-operation could be instituted, the gaps separating those interested in this matter might be bridged to the mutual advantage of all. In furtherance of this aim, there has been formed a Design and Industry Association embracing representatives of Manufacture, Distribution, Design, and Art Education, to study the means of bringing about a co-operation that shall fulfil this purpose.

During the school year 1913-14, 44,154 students attended schools of art, art classes, and branch schools of art, exclusive of Scotland and Ireland, and of classes registered under the Board of Education regulations for Junior Technical Schools. Of these students, 2,793 are described as full-time and 6,440 as part-time day pupils. Evening students classified as architects, artists, art teachers, and industrial, numbered 12,730 and unclassified evening students numbered 12,210. There are, in England and Wales, 212 schools of art, 22 branch schools of art, and 56 art classes. W. B. D.

ART, THE ENGLISH GOVERNMENT SCHOOLS OF.—English State-aided schools of Art originated in the establishment of the "Central School of Design" at Somerset House, in 1837, under the Board of Trade, for the express purpose of giving instruction in the principles of design in relation to the industries of the country.

Up to this time, little civic or Government effort had been made in England to encourage the arts of design, either by training the craftsman or educating public taste. Hence this event was the beginning of what is now recognized as an essential part of our educational system.

In 1852 the school was re-named the "Central School of Practical Art," although a considerable portion of its curriculum was devoted to the training of teachers; but a supplemental class in design was commenced at Marlborough House, and in the following year the Central School was also transferred there under the administration of the "Department of Science and Art" of the Board of Trade. This continued until 1856, when it came under the "Committee of Council for Education"; and in the following year was removed to South Kensington and re-named the "National Art Training School." The title "Royal College of Art" was given about 1897, and the college was again reorganized in 1900.

Some of the large provincial schools of design were founded shortly after the Central School (*e.g.*, Manchester in 1838 and Glasgow in 1840). In 1851 there were the following eighteen branch schools of design: Spitalfields, Coventry, Birmingham, Stoke, Hanley, Manchester, Huddersfield, Leeds, Sheffield, York, Newcastle, Nottingham, Norwich, Glasgow,

Paisley, Dublin, Cork, and Belfast. These branch schools were assisted by a Government grant, and the average cost to the public of their maintenance was about £800 per annum.

Among the schools of the late "sixties" and early "seventies," that of the Working Men's College, Bloomsbury, is perhaps the most remarkable, with its voluntary staff of teachers, which included John Ruskin, Dante Rossetti, Madox Brown, Thomas Woolner, and Lowes Dickinson, with their virile personalities and devotion to art, and their keen and sympathetic interest in their students, among whom was the writer of this article.

Financial Support. From the foundation of the Central School in 1837 to the present time, there has been a slow but consistent growth of public appreciation of, and support for, the State-aided schools of art, of which there are now some 300. These are now chiefly under the municipalities, thus enjoying a more liberal equipment and curriculum, lower fees, comprehensive schemes of bursaries and scholarships, and a more intimate connection with the industrial activities of the district. The activities of the modern school of art necessarily vary in different schools according to the civic and Government support of the *personnel* of the staff, the interest and appreciation of the citizens, and the school's environment. For instance, such a school as that of Manchester, in the North, with its utilitarianisms and marvellous production of textile fabrics, must necessarily lay greater emphasis on the study of practical design than, say, the schools at Brighton or Hastings, in the South, with their residential populations and freedom from large industrial works.

Undoubtedly, one of the most potent influences upon art activities is that of environment, and it is here that some art schools are more fortunately placed than others. The London schools, some eighteen in number, have many advantages over provincial schools by reason of the magnificent parks, museums, and galleries near them, with their wealth of material available as artistic suggestions to alert and receptive minds.

Many of the larger provincial schools now have well-arranged and comprehensive museums in close proximity, giving students opportunities for the study of fine modern and traditional examples of craftsmanship, as standards of taste and as an incentive to excellence.

The Co-operation of Art and Industry. To secure the necessary co-operation of art and industry, and keep in touch with modern conditions of production, an advisory board of representatives of employers and workmen is now usually associated with the committees of the larger schools of art in industrial centres; hence we have well-organized courses of instruction under special teachers for students engaged in industries associated with art, with facilities for research and experimental work which is not possible in the workshop.

The curriculum of the larger schools includes not only instruction in the chief graphic arts and architecture, but also practical specialized courses (as required) in gold and silversmiths' work, jewellery and enamels; stained glass, pottery and terra-cotta; wrought iron and casting in bronze; modelling and plaster-work; marble, stone, and wood-carving; etching, lithography, book illustration and colour work, typography and bookbinding; lettering and illuminating; cabinet-making, interior decoration, and house painting; designing for woven and

printed fabrics and wallpapers; lace, embroidery, and dress design.

Many schools have now undertaken the preparatory training, both educationally and vocationally, of young people for various crafts and industries, continuing their general education and giving them a sound training in the technique and in the fundamentals that underlie specific industries or crafts. Those who show aptitude and ability are encouraged, and the unsuitable are weeded out. In the future there should be an intelligent body of highly trained and resourceful workmen, grounded in fundamentals, artistic in temperament and knowledge, having technical skill and keenly interested in the success and possibilities of their own craft or industry.

Now that the system of apprenticeship is largely disappearing, it is imperative that schools of art and technical schools should take up this educational work, if progress is to be made, and a high standard of excellence in artistic crafts and industries maintained.

The chief difficulty in the way of a yet wider appreciation of the schools as a factor in the industrial activities of the country is undoubtedly the indifference of the public, the manufacturer, and the workmen.

The manufacturer's aim is not so much to produce an artistic and beautiful object as a saleable and profitable one; the average workman has little interest, except financial, in his work, owing mainly to the subdivisions of labour, which acts injuriously on his personality, and restricts his outlook and pleasure in his work.

The Board of Education are fully alive to the necessity for a closer connection than there has hitherto been between schools of art and those industries or crafts in which art is essential for attractiveness in form, colour, or pattern; and they welcome the efforts made by municipalities in that direction.

The Board award prizes for excellence in the various stages of art. The public exhibition of prize work (in abeyance during the war) has for a number of years shown a high degree of achievement in technical skill, versatility, and originality of treatment. This promises well for the future as regards the status, skill, and resourcefulness of the artist-craftsman, and the advancement of the arts in their application to industry.

R. G.

ART FOR SCHOOLS ASSOCIATION.—The Art for Schools Association was founded in 1883 with the following objects—

1. To negotiate with art publishers for the purchase of engravings, photographs, etchings and coloured pictures on advantageous terms, and to supply them at reduced prices to schools.

2. To reproduce works of art especially suitable for schools, and to publish them at the lowest possible prices.

3. To lend, and occasionally to give, engravings, photographs, etc., to poor schools.

4. To assist in, or otherwise promote, oral instruction such as may explain works of art in our national collections, and those supplied to schools by the Association.

5. To advise schools and school teachers with regard to illustrations and illustrative matter.

The Association usually publishes a few pictures of its own production every year, as well as reproductions of standard works of old masters.

The Association has three classes of members: associates, who make a donation of one guinea to the Publishing Fund; annual subscribers of one guinea or half a guinea; life members, who subscribe ten guineas.

Associates may purchase the publications of the Association at members' prices; annual subscribers and life members also receive the Association's publications free as they are issued. Schools are always supplied with pictures at reduced rates.

For the equipment of history rooms, the Association supplies photographs, etc., illustrating the chief events of history of all ages. For Greek history, it has views of places and buildings, and photographs of statues. Roman history is similarly represented; and, in addition, there are pictures of chariot races, youths on horseback, and athletes. English history includes photographs of relics of the Stone, Bronze, and Iron Ages; implements used by the Britons and Anglo-Saxons; early seals; the Bayeux tapestry; famous buildings and famous people down to the present day.

Sacred subjects include reproductions of pictures of all the famous European schools of painting: Botticelli, Dürer, Raphael, Titian, Leonardo da Vinci, and Holman Hunt are represented in colour. The uncoloured sacred subjects are reproductions of Fra Angelico, Bellini, Botticelli, Dürer, Jan Van Eyck, Hans Memling, Holbein, Murillo, Raphael, Sir Joshua Reynolds, Titian, Vandyck, and many others.

Landscapes include some of the best works of Constable and Rembrandt; photogravures of birds and beasts; Irving's "Trees in Summer and Winter"; many of Landseer's and Turner's works.

Geography and Topography are especially well illustrated by copies of Flemish, Spanish, Italian, and British works of art.

Architectural subjects include coloured pictures of Oxford and Cambridge Colleges, London views, and Windsor Castle; and uncoloured pictures of Egyptian, Greek, Roman, mediæval and modern temples, monuments, etc.

A special series of carbon photographs by living artists has been prepared to illustrate stories for infant schools.

The office of the Association is at the Passmore Edward Settlement, Tavistock Place, London, W.C.1, where specimens of all the works published by the Association may be seen. A descriptive catalogue is issued.

ART INSTITUTES.—The teaching of art in the United States is carried on in many types of schools, and the variety of conditions prevents the adoption of any uniform system of central control such as is found in England. In many large cities, Art Institutes have been established, and the nature of the teaching is largely influenced by local needs. In Baltimore, the Maryland Institute of Art and Design devotes attention to architecture and applied arts; and in Chicago, the Art Institute, associated with the Armour Institute of Technology, has separate schools for decorative design and architecture. In Indianapolis, metal work, wood-carving and ceramic art find a place. New York has schools of Applied Art and Design; and the Pratt Institute provides a general art course of four years preparatory to specialization in portraiture, costume drawing, oil and water-colour painting, many varieties of textile, wood and metal work, and architectural drawing. The

Institute of St. Paul, besides the general art courses, provides others in design and handicraft work.

ART MASTERS, THE NATIONAL SOCIETY OF.

—This was founded in 1888 to further the interests of art education, of Schools of Art, and of those engaged in art teaching. It consists of Full Members and District Members. Full members are: (1) Teachers holding such art teaching certificates, other than the Art Class Teacher's Certificate, as are or have been approved by the Board of Education; (2) teachers holding a diploma of the Royal College of Art; (3) teachers who have been exceptionally recognized by the Board of Education as headmasters of schools of art; (4) and art or craft teachers, whom, in the interests of the Society, the Council elect as members.

The management of the affairs of the Society is in the hands of a council, which is elected by the members under a system of electoral districts, of which there are eleven. Each district may elect district members, who may be teachers of art and art craft not desiring, or not holding the qualification for, full membership, or ex-art teachers.

The Society grants certificates of Fellowship and Associateship to members under the following conditions: A candidate for a Fellowship (F.S.A.M.) must have been a member and full-time teacher of art for four years, or part-time teacher for seven years. He must also submit work as evidence of his attainment, or write a thesis on some art subject and send a fee with each application. A candidate for an Associateship (A.S.A.M.) must have been a member of the Society and a full-time teacher for two years, or four years as a part-time teacher, and pay a fee.

The Society's Journal issued to members contains editorial notices, reports of council meetings, papers and discussions at district meetings, and general art news.

The Examination Board of the Society holds examination for the School Drawing Certificate for teachers in elementary schools. The examination consists of three parts: (1) Exercises worked in monochrome, pastel, and water-colour; memory drawing on blackboard; and in two of five other optional subjects. (2) Evidences of various studies made. (3) A paper written upon any of the various practical problems of class teaching of drawing. The examination lasts a week.

The Society issues a Syllabus of Drawing framed to cover an educational course, and indicating main ideas, each with a definite purpose; and will report upon work done in the various subjects therein set out, and also issue examination papers to Principals who wish their pupils examined in three compulsory subjects. The school authorities conduct the examination, and send the papers to the Society, which grants certificates to all obtaining half marks in each subject.

The office of the Society is at 45 Bedford Row, London, W.C.1.

ART NEEDLEWORK, THE ROYAL SCHOOL OF.

—This was opened in 1872. Lady Welby, who was herself an embroideress of considerable ability, conceived the project of founding a school for the revival of embroidery as an art, for the stimulating of original ideas and designs, and to provide work for ladies who have to earn a livelihood. The difficulties of such a project were great; but in consultation with Mrs. Dolby, a small apartment was

hired in Sloane Street, and six ladies selected as workers. Much help was given by Mrs. Dolby, who was a great authority on Church embroidery; and shortly afterwards Her Royal Highness Princess Christian became President and gave her active co-operation. The school soon outgrew the small rooms in Sloane Street where it first saw life, and removed to larger premises in Exhibition Road, where it found a home in part of the Exhibition buildings, and Queen Victoria became its patron. Three years later, it was incorporated under the Board of Trade, with managing and finance committees. In 1899 the school had increased and developed to such an extent, that the need for a building of its own was felt to be necessary, unless the work was to be hampered. A site in Exhibition Road was granted by H.M. Commissioners for the Exhibition of 1881, and the present building was erected and opened in 1903 by King George V, then Prince of Wales. In it there is ample accommodation for embroidery, designing, upholstery, and showrooms; other rooms for the mending of tapestry; a special department for the mounting of embroidery; a large dining-room, kitchen, and domestic offices; and an entire wing set apart for the training school.

The conditions on which ladies were received as members of the school was the possession of small means, gentle birth, and sufficient ability in needlework to enable them to support themselves and be trained to teach others; and from 100 to 150 ladies at a time have been trained and employed there. The management found it necessary to avail themselves of every means of instruction and experience in order to fit the school for the position it now holds.

Activities and Development. It was expected to be competent to judge old work, and name its period and nationality; to restore and, if necessary, to add to it; to know and teach every stitch used in old or modern work, and to produce designs for every period. All this involved much study and research, and great assistance has been afforded by the authorities of the South Kensington Museum, who gave access to their splendid collection of old embroidery. The school also profited greatly by the Loan Exhibition of Old Needlework, which, at the suggestion of H.R.H. Princess Christian, was organized in 1875. This was followed at various intervals by three other interesting loan exhibitions; and, in the meantime, the school grew in experience and reputation. Its ramifications were many and wide. Branch schools were started in England and Scotland, in New York and Philadelphia; and teachers were sent to the Colonies and to all parts of the world.

In 1895 the committee opened a training school for professional embroideresses, the need for which has been proved by the way in which this particular branch has steadily grown and increased. The students receive a thorough training in embroidery, plain needlework, and teaching, with sufficient knowledge of the principles of designing to guide them in the selection and application of designs. The training necessary for obtaining a full diploma occupies three years; a certificate may be gained after two years', and an award after one year's, training. These students are also eligible to compete for the scholarships and exhibitions awarded by the London County Council. Besides the training school, there are evening classes for those who cannot afford the time or money for a complete

course. The work carried out by the school includes the funeral pall for Her late Majesty Queen Victoria (which was embroidered and made up in twenty-one consecutive hours); King Edward's Coronation robes and Royal Garter banner; the Garter banner for Queen Alexandra; altar frontal and reredos for the Chapel of Edward the Confessor at Westminster Abbey; curtains and tapestries restored for Holyrood Palace; the repairing and making of regimental colours, etc. The school has on many occasions obtained the highest awards for work exhibited, including the following: Paris, 1900, gold medal; Chicago, 1900, gold medal; Earl's Court, 1900, gold medal; St. Louis, 1904, Grand Prix; Milan, 1906, gold medal; Australia, 1907, Grand Prix and gold medal also. Grand Prix for fixed decoration of houses and Grand Prix for book decoration. It has also received awards at the following exhibitions: Philadelphia, 1876; Crystal Palace, 1884; Newcastle, 1887; Glasgow, 1888; Tasmania, 1895.

No history of the school would be complete without an acknowledgment of the great part played in its development by Her Royal Highness, its beloved President. Without her untiring guidance and encouragement it could never have achieved its present success, and workers and managers alike have been stimulated by the thought of her care and interest in its welfare. Much is also due to Lady Marian Alford, who became Vice-President in 1872, and whose active co-operation and assistance contributed much to the success of the school.

W. M. ff.

ART ROOMS, THE BUILDING OF.—(See BUILDINGS, SCHOOL.)

ART SCHOOL, TEACHER IN AN.—It is eminently desirable that a teacher in a school of art should be both a good artist or craftsman and a capable teacher. It is now a practice of the Board of Education to require that a teacher in a school of art should have not only good qualifications in art, but (in addition) shall have had as good a general education as any other teacher, and that a satisfactory course of training in the teaching of children and in the relation of art to industry shall have led to the candidate's passing an examination.

The effect of the improved qualifications upon the status and salary of teachers in schools of art will probably be that, whereas the salaries used to be intermediate between those of elementary and secondary teachers, they will in future approximate to those of specialist teachers in secondary schools (*q.v.*).

A. C. C.

ART TEACHING, AIMS AND IDEALS IN.—The only ideals which are held quite unaltered from decade to decade are those which command but languid lip-service and have never become programmes to be tested in practice. Such contact between an absolute principle and composite actuality usually leaves the former a little the worse for wear in public esteem, so that it is hastily discredited and replaced by another as different in superficial aspect as possible. To palliate this tendency to an exaggerated zig-zag in our progress, the practical man may wisely study ideals in the concrete forms in which they appear, and distinguish between their intrinsic merits and demerits and those imposed by the character of their exponents and the nature of their *milieu*.

Teaching at the Academy Schools. In examining

the functions of art teaching, we have first to meet a certain fund of opposition to any teaching at all as so much unwarrantable interference with the budding artist. To take up this attitude is to be too egregiously the dupe of the illusion of individuality. Art transcends the experience of any artist: it is a world in which we find the emotions of our predecessors distilled in purer and more succinct form for our use, and, so far from his having the *entrée* into this domain limiting a student's expression, it is usually only when he has moved in it awhile that his eyes are opened and he is able to disengage from his personal existence the material from which the dream-world is built. Esoteric appreciation of the phrase "Art for Art's sake" implies recognition of this continuity of experience in a kind of apostolic succession, which, translated into popular terms, has been taken to imply that the eminent artists of one generation are the best teachers of the next. In France, this has sometimes had a valuable conservative tendency, though even there the best students are frequently derived from the ateliers of men like Gustave Moreau or Lecoq du Boisbaudran—theorists as much as practitioners. In England, we find the principle materialized in such an institution as the Royal Academy schools, with the quaint admixtures due to a civilization more individualistic, and standards of artistic eminence based rather more on commercial success. In the immediate past, some of the older and more obscure Academicians were capable of handing on a technical tradition of sorts in the craft of painting. They had little prestige, however, with the students, and their utility was sacrificed to the system (convenient to Academicians), whereby visitors served in rotation. According to its defenders, the system forced the muddled students to think for themselves; but, in reality, as they did hardly any work which did not lead up to valuable money prizes, they were tempted to cater for the average taste of the majority vote of Academicians—tempted the more because, to judge by my own acquaintance, they were usually attracted to the R.A. rather by the prizes than the teaching. In evaluating the prestige of a large and crowded school, the effect of acute competition should not be overestimated. Ideally speaking, the desire to excel is a stimulus different in kind from enthusiasm for art, and to give it undue importance is good showmanship, but bad training. By itself, it makes for rapid progress, and as rapid decline when it is withdrawn.

The Slade and Royal College of Art. Latterly, the monopoly of these pacemaking advantages has passed largely from the R.A. to the Slade School, and here, again, the rather sheeplike crowding of students was largely due to other attractions than the teaching (*i.e.*, the facilities offered to the more advanced for exhibiting at the New English Art Club, the most favourable *milieu* for introducing fresh talent to the more up-to-date section of the public—and to the Press). The latter was a doubtful influence. It was just realizing its power; had been profoundly impressed by the apparent triumph of successive "forward movements" in Art; and welcomed originality at any cost, and, as lending itself to journalistic treatment, anything which seemed to denote a well-marked personality. In both the Slade School and the Royal Academy, moreover, the training of students by more or less eminent artists has resulted a little in teaching by specialists for specialists. Neither school had quite the advantage (which should belong to institutions

of such size) of a general artistic culture induced by the practice side by side of different yet related arts. The Academy had a school of architecture, but neither the painting nor sculpture done alongside of it betrayed the fact. The Slade was even more exclusively a school of drawing for the purposes of painting, though the drawing was taught on more constructive principles; and within the last few years some attempt has been made to broaden the basis of education. The ideal of maintaining a relation between the Arts has (perhaps as a legacy from the time of Alfred Stevens) been more consistently pursued at the Royal College of Art by the attempt to co-ordinate painting with architecture, by the training for industrial purposes carried on alongside of these, and by the wide range of study demanded by the Examination for Art Masters' Certificates. The last element tended to vitiate the whole, plausibility being, perhaps inevitably, tolerated by examiners, lest, by an apparently inconsistent standard, competitors should be discouraged. They were finally discouraged by quite other causes: the County Council had, by its competition, killed or absorbed the smaller London Art Schools and established a monopoly of evening classes. It proceeded to set the fashion of appointing teachers who had never even thought of entering for a South Kensington examination.

Evening Art Classes. And here we come to two brusquely divided conceptions of Art teaching. As du Boisbaudran puts it: "The Professor *tells* you how to do a thing; the Master *shows* you." Each type is valuable, but the examination system failed to produce the ideal theorist. Moreover, the Council Schools were captured by representatives of the Arts and Crafts Movement, who distrusted theorists—above all, if tinged with the sophisticated Renaissance culture absorbed by Stevens. They wished rather to abolish the hierarchy of professional artists, and aimed in their evening schools at an almost mediaeval revival of craftsmanship: at finding a substitute for apprenticeship, whereby the boy learns his job from the man who makes his living at it. As we know, with this was combined the curious device of judging the efficiency of teachers by the attendances; and, after all, perhaps most capable teachers would rather thus be judged by their students than inspected by the average committee of eminent men of the last generation, out of touch with the ideals of the present or the problems of the future. At the same time, the student's idol among practitioners of an art is apt to be the idol of the market-place, close imitation of whom will bring him immediate success in youth, and leave him outmoded and void of progressive ideas in middle age: for the popular hack of one generation is never that of the next. From an ideal point of view, moreover, the fact that a thing is, in our imperfect civilization, remunerative, by no means implies that it should be our aim to teach it. We spend no public money, for example, with a view to training "turf accountants." The danger of the system is that students may be taught only what they are inclined to learn, which is by no means necessarily what is good for them—still less what is to the interest of the general development of art, compared with which, in a public sense, their personal and commercial prosperity is of subordinate importance. In this latter respect, a boy catches a certain sporting enthusiasm more readily than his parents, who, shrinking from necessary risks, are liable to reproach a teacher for

communicating an artistic sensibility which his own experience has shown to be as yet indifferently marketable—as if it were among the functions of the art master to infect the buoyancy of youth with the personal prudence proper to middle age.

The Relation of Arts and Crafts. Reasonable reconciliation of the claims of the artist to a livelihood from his art with the claims of art on the self-sacrifice of the artist is one of the difficulties of the teacher. It becomes greater if prejudice induces him to discourage students from any legitimate activity. The men associated with the Arts and Crafts Movement were by no means lacking in practicability or commercial aptitude within the boundaries of their prejudices, but those boundaries were narrowed by certain circumstances of their origin. Their devotion to craftsmanship was too retrospective (showing that museums are a danger as well as an inspiration), so that they hated machinery as an invention of the devil, instead of regarding a machine as but another tool, with its own limitations and possibilities to be observed by the designer. This put them out of touch with modern industry, and condemned them to devote themselves largely to "luxury trades" with wealthy buyers. This weakness is already producing its reaction. Again, in recoil from the narrowness of the Academy's preoccupation with painting, they had a certain jealousy towards that art, except in its most primitive forms, which they had not the masculine draughtsmanship and power of bold abstraction to handle for modern purposes. Drawing from life under their teaching tended to a timid literalism, very like that which had offered the safest road to prize-winning at the Academy schools. The teaching of drawing in this department is already, however, coming under more modern influences. That of the school of painting, which more or less descends from impressionism, has the merit of being more contemporary and vital; but it is a specialized art hardly related to the crafts, and lacking something of the limited but definite decorative applicability of Renaissance painting. It offers, moreover, no training in inventive design, but leans heavily on the model, heedless of the fact that, in present commercial conditions, models are rare luxuries to most artists. What is called Post-Impressionism has as yet influenced teaching but little, but it is at our doors: a somewhat clumsy emissary of the ideals of the East, with their more conscious recognition of convention as the basis of Art—the hieroglyphics in which (however various the script) Art expresses itself. In none of these later developments (unless we see Post-Impressionism as the precursor of a more complete conquest of the West by the East) do we see signs of the power of systematic thought which will co-ordinate our arts and crafts into a consistent style. If there is any suggestion of such a style, it is in the direction of greater simplicity in the treatment of the various materials used, and rather less differentiation between the respective domains of each material. Renaissance Art was highly systematized, but a little redundant in its provision of copious machinery of mouldings and borders by which the different arts could be kept so severely in their places as to be allowed an almost unnecessary internal freedom of development. One thinks of an old-fashioned Italian opera doubtless with a certain amount of dramatic unity, from which, from time to time, with due heralding to mark it as a detachable episode, a little figure

steps forward and gives us, say, "Una voce poco fa"; for all the world like a statuette in a niche. More modern movements in Art are more like Wagnerian opera, aiming not so much at systematic parcelling out as at fluent homogeneity—one thing passing into another, as though all were but disguises of the same elements. We see it in its barbarous form when a modern painter decorates his house in primary colours throughout; heedless of materials—walls, ceiling, furniture, curtains, pottery: all alike daubed with paint. In such a phase, Post Impressionism makes us fear lest it should prove a movement as devoid of craftsmanship as *l'Art Nouveau*, though of more intellectual force. My frank criticism of the more obvious varieties of existing art teaching will fail of their object if I have not made clear that there is hardly one that does not stand for some valuable principle, however unsatisfactorily combined with other elements. If we regard them in their concrete form, our arrangements appear contradictory and antagonistic to each other on the one hand, yet with the frequent overlappings abhorred of the economist; but, if we think fairly of the intentions of these institutions, and realize that all institutions ultimately belie their intentions, we shall beware lest, in hurried reform, we improve out of existence elements of artistic life which were still of use. There are parts of England where the artistic time of day is 1920 or even later; others are still in the middle of the nineteenth century. A movement towards co-ordination is probably inevitable; but whether it will be successful depends not on the intelligence only of the quasi-autocrats who seem to control it, but on that of all the units of the educational machine, who, by falling in readily with wise administration or kicking at the trammels of mere red tape, play as important a part. Organization is only effective when it is the expression of insight and backed by a genuine and general impulse.

W. B.

ARTICLE 68.—(See TEACHER, SUPPLEMENTARY.)

ARTICULATION.—This is defined by Murray as "the utterance of distinct elements of speech." Professor Whitney, in the *Proceedings of the American Philological Association*, 1881, says: "Articulation is virtually syllabication—a breaking of the stream of utterance into joints, by the intervention of closer utterances or consonants . . . between the opener utterances or vowels." (Open sounds are those in which the breath stream has free and practically unrestricted exit from the mouth. Close sounds are those in which the breath passage is considerably narrowed.) A. M. Bell, in the *Principles of Elocution*, wrote: "All actions of the vocal organs, which partially or wholly obstruct or which compress the breath or voice, are called articulations." In the 1878 edition of the same work we find the additional words: "The oral actions here denominated articulations are more commonly called consonants."

Articulate human speech, therefore, requires the separation, or "jointing" of the more sonorous and more carrying sounds (generally vowel sounds) from one another by the interposition of less sonorous ones (generally frictional sounds). Now, vowels are more sonorous than consonants, and open vowels, such as *a* and *o*, than close vowels, such as *i* and *u*.

In *fatherless*, for instance, the three sonorous

sounds *a*, *er*, and *e* are "jointed" by the less sonorous *th* and *l*; hence there are two articulations and three syllables. In *ayah* the two relatively sonorous vowels are divided by the less sonorous sound of *y*; hence "*ayah*" consists of two syllables. There are at least three degrees of care which must be devoted to the consonants, and these are determined by the style of speech used at the time. The determining styles may be called the "conversational," the "declamatory" or "oratorical," and the "singing."

In conversation, speaker and hearer are usually close to one another, and therefore highly marked separation of vowels is not necessary. Thus, even whispered conversation is quite comprehensible though there is comparatively little difference in sonority between consonants and vowels, and in this case, the consonants are, perhaps, the more forcible.

In oratory or declamation, the words are intended to be heard distinctly by people at a greater or less distance from the speaker. It is, therefore, necessary that the separation should be more defined than in conversation. Many speakers endeavour to attain this object by shouting, a proceeding to which there are two objections: (1) it is wearying and exhausting for the speaker; and (2) it is trying and monotonous to the audience. Clearness of enunciation may be attained by uttering the vowel-sounds with full resonance, and by increasing somewhat the duration of the consonants. The "hammering" or very strong emission of the consonants, especially of *p*, *t*, and *k*, is an objectionable feature, giving the impression of unnecessary effort on the part of the speaker.

In singing, the vowels should be emitted with the fullest resonance possible, which does not mean that they should be sung as loudly as possible, but that the resonance chamber of the mouth should be made use of so as to produce rich harmonies. The hard (*i.e.*, voiceless) consonants will, to a large extent, take care of themselves, as it is impossible to sing them, and the absence of voice will in itself produce the "jointing." In uttering the soft (*i.e.*, voiced) consonants, the friction of the breath or its complete stoppage for a short time should be somewhat accentuated.

To sum up, distinctness of speech depends upon clearness of articulation, which can best be attained by making the contract between open and close sounds as clear as possible.

ARTIFICIAL LANGUAGE.—The term artificial language is here assumed to mean a language designed to facilitate international intercourse. Many having this aim have been devised, *e.g.*, Volapük (in which roots are often unrecognizably disguised), Idiom Neutral, Pan-Roman, European, Neo-Latin, Esperanto, Ido (a simplified Esperanto), etc. Any artificial language should have five main characteristics: (1) Its roots should be easily recognizable by the educated of most nationalities; (2) its grammatical structure should be simple and logical; (3) there should be no grammatical irregularities; (4) the speech-sounds employed should present little difficulty to any nation; and (5) the written language should be spelled phonetically.

Since Romance (Latin) roots are those which have most freely penetrated into the languages of the world, it would seem advantageous to make them the base of any artificial language. Artificial roots are open to innumerable objections. Where

non-Latin roots have established themselves internationally, these might be introduced. The choice between Latin and non-Latin might sometimes be difficult: *e.g.*, *homin-* and *man-* (man), *fac-* and *mak-* (make, do) seem equally widespread. But *dom-* (house, building) has clearly found its way into nearly all European, including Slavonic, tongues (*e.g.*, Russian and Polish *dom*).

Whatever root-basis be adopted, the sentence-structure of any artificial language should obviously be analytic [*i.e.*, word function should be clearly shown by (a) logical sequence, and (b) links such as prepositions and conjunctions]. English, and modern Romance tongues largely, have adopted the sequence—Subject, Predicate, each with its complements closely attached, and links are largely used.

Inflections should be limited in number: case terminations are unnecessary, and the only inflections of substantives should be those of number, and, sometimes, of gender. Adjectival agreement can be neglected, as in English and predicatively in German, without sacrificing clearness. Verbs should be inflected for mood and tense alone: personal terminations (originally pronouns) are unnecessary where the person of the subject is known, and modern Scandinavian usage should be followed. A fully conjugated English verb has, at most, seven forms, two only of which are personal; the subjunctive and optative moods, which are moribund, could be replaced by conjunctions with the indicative. Gender must correspond with sex. Prefixes or suffixes should be absolutely regular in use and unvarying in effect, *e.g.*, *in* should not have two meanings ("within" or "inwards" and "not"), and *en* should be either diminutive (*e.g.*, "maiden") or adjectival (*e.g.*, "wooden"). Infixes should be inadmissible.

There are in nearly all languages some twenty speech sounds, which are recognizable, if not identical, and these should be employed in an artificial language. The existing Roman alphabet could represent these (see INTERNATIONAL ALPHABET), though *c*, *q*, *x* might be "scrapped," and *j* and *y* have new values assigned. The vowel system could be very simple, the existing symbols taking the values obtaining in "standard" Spanish. These vowel sounds exist in nearly all languages, and a sufficiently satisfactory pronunciation of them could be acquired by anyone.

By the judicious use of some five or six hundred roots and two score of well-chosen prefixes and suffixes, an expressive, harmonious, and expandable language could be devised; and, though this could never, in the writer's opinion, reach the literary excellence of national tongues, it might, nevertheless, be in a very high degree both precise and flexible.

G. N.-A.

ARTS AND CRAFTS RENAISSANCE. THE.—The history of the arts and crafts in Europe from mediaeval times until the end of the eighteenth century shows many fluctuations of style and character corresponding to the changing ideals of civilized life, or due to those economic and commercial causes that have always influenced design by affecting the supply of the materials of the arts or by introducing new motives of decoration. The importation, for instance, of silk and porcelain from the far East, of printed cottons from India, of brocades from Italy had each in turn an effect on native design and craftsmanship in our own

country. But the condition of the arts and crafts may be said to have remained stable, although varying in character, during the centuries that preceded the industrial revolution of the early nineteenth century.

The changes that were brought about by the introduction of steam power and of the mechanical inventions that were consequent upon it were so great as to form a new era and an altered type of civilization.

The first effects of the industrial revolution brought apparent disaster to the arts and crafts by the gradual destruction of the system of apprenticeship and the extinction of the small workshops of the various handicrafts that were formerly part of the life of every town and village. In place of these scattered industries, necessary to the life of every community, great industrial centres arose in localities convenient for the supply of coal or of raw material, and the factory system transferred to these great centres the formerly widespread industries and artistic crafts. But, as these were absorbed in the new industrial centres, the teaching agencies of the old apprenticeship system which had always preserved the traditions of fine craftsmanship and design, gradually died and disappeared. In the place of Guilds there arose Trades Unions, but these new controlling bodies exercised their power without relation to quality either of design or of craftsmanship, and the standards in all our artistic crafts became debased and commercial as the prolific power of machinery increased.

The Recovery of Artistic Crafts. The state into which our arts and crafts had fallen during the first half of the nineteenth century may be inferred from the writings and protests of the artists of that time. In the works of Ruskin the advent of the age of machinery is constantly lamented as a disaster. William Morris in *News from Nowhere* and Samuel Butler in *Erewhon*, imply the same evil effect of machinery upon the arts and upon social life. Morris, however, took practical steps and vigorous measures for the recovery of the artistic crafts and their salvation from the overwhelming tide of the new industrial system. He demonstrated by his own practice and example the dignity and artistic scope of the neglected crafts. He studied and practised, in turn, the arts of dyeing, and weaving, stained glass, printing, furniture making, tapestry, reviving in each the high traditions and standards of early mediaeval craftsmanship. With his colleagues, Burne Jones, Rossetti, Walter Crane and their followers, a Renaissance of the arts and crafts began in England, and its influence spread gradually through Great Britain, reviving and in time affecting the artistic culture of the United States, Germany, and France. Arts and crafts societies were formed and exhibitions were held in London and in all provincial centres of artistic culture.

Work of the Arts and Crafts Movement. The arts and crafts movement which originated with the circle of associates of William Morris has continued to the present time. It began as a reaction from the new development of the industrial system which the founders of the arts and crafts societies had looked upon as evil and inimical to art. The movement made no attempt to influence modern industrial manufacture, but only to preserve the standards of the artistic crafts, and to encourage their practice on the lines and by the methods of

mediaeval craftsmanship. In this aim the movement had undoubted success. Excellent examples of work in the artistic crafts were shown from year to year in public exhibitions and in the workshops of many art-craftsmen and of village industries. An annual exhibition was held in London, and up to 1914 and in the years immediately preceding the war, exhibitions of English arts and crafts were held in Belgium, and, by invitation of the French Government, in Paris.

A permanent and valuable record of the work of this movement and period is embodied in a series of craft text-books written by the most distinguished craftsmen of the time and produced under the general direction and editorship of Professor W. R. Lethaby, who, more than any other individual artist or craftsman, gave actual and enduring form to the ideals and aims of the founders of the new movement. In these books the ideals and traditions of each craft are permanently stated and preserved.

In England, up to the time of the war, the arts and crafts movement had little or no effect upon our industrial manufacture. The machine-made products of the artistic trades were still mainly imitative. In colour printing, for instance, the aim was to imitate work done by hand. In textiles the machine approached as closely as possible to the design of fabrics of the hand-loom. Design in industrial manufacture was chiefly a matter of adapting or reproducing old forms.

The renewed interest in design, stimulated by the teaching of fine craft work, spread, during the early years of the present century, and influenced even the designers for machine-made work. A new type of design became the aim of the trade designers. The special characteristics and possibilities of the mechanical processes were more closely studied. Designs having their own special technique and character were now made for the machine; and the new tendency towards this more artistic use of machinery replaced the old imitative method. The modern poster, for example, is no longer an imitation of a painting, but is a work of art having a character and technique of its own. So, in other trades, the machine is becoming more and more a means of expressing design in the industrial arts, and not merely of imitating designs properly belonging to the handicrafts. In this way the very influences that revived and renewed the arts and crafts have had an indirect influence in raising and purifying the standards of design in industrial manufacture.

F. M. F.

ARTS, THE SEVEN LIBERAL.—The conception of a "complete and generous education" in ancient times was that of a training in the "whole round" of knowledge (*i.e.*, in the ἐγκύκλιος παιδεία). Such a conception involved an analysis of all knowledge into "subjects" (*i.e.*, a differentiation of the different kinds of knowledge and re-organization into a complete curriculum). Thus Plato, in the *Republic*, based the earlier form of education on music (including what we term literature) and gymnastic; and, later, education, between the ages of twenty to thirty, on the study of the sciences of arithmetic, geometry, formal music, and astronomy. These subjects substantially formed the "round" of education both through the Ancient Greek and Roman Times, and also through the Middle Ages. We may interpret Plato's training in music, following Nettleship, as the

attempt to bring about the love of the beautiful in literature by means of myths and the whole equipment of what we call *belles lettres*; but, educationally, only such subject-matter should be used as will inevitably tend to the development of a spirit of noble reverence and deep-seated morality. So, in the later education, scientific training in arithmetic, geometry, astronomy, music, aims at the enthronement of the search for truth. Finally, the pursuit of beauty, through "musical" studies, and of truth, through what we may call the "scientific" subjects, are united in the all-absorbing aim of "the good," "that supreme source of light of which everything good, everything true, and everything beautiful in the world is the reflection." Education, therefore, is the growing into this magnanimous spirit of life. All arts, or subjects of study, are of value in as far as they are cultivated to this purpose. In other words, we may interpret Plato as urging that in this spirit of study consists the "liberality" of the arts of study. Aristotle distinguished between subjects themselves as liberal and illiberal. Liberal subjects are the studies which make the freeman a better man intellectually and morally. If the body, soul, or intellect is deteriorated by a study, or even if it is learned for wage-earning purposes, such a subject is illiberal. To be liberal, a subject must be freely chosen by a freeman for ennobling purposes. The idea of any liberality in the "arts" or "subjects" themselves, if it was ever held, was lost by the Middle Ages, when the "Liberal Arts" meant the preparatory studies to philosophy or to theology. The Middle Ages were intent on systematization, as we see in the feudal system, in the ecclesiastical organization, and in chivalric procedure. Accordingly, mediaeval education developed a heptarchy of arts as the innumerable divisions of England were reduced to a heptarchy of kingdoms. When the encyclopaedia of arts was determined to be seven in number is debatable. It is certain that Martianus Capella, an African follower of Plato, in the first part of the fifth century, uses the number seven, and names the "arts" as follows: Grammar, Dialectic, Rhetoric, Geometry, Arithmetic, Astronomy, Music. Capella's book, written between A.D. 410 and A.D. 427 (Mr. Parker puts the date even before A.D. 330), is called *The Marriage of Philology and Mercury* (*de Nuptiis Philologiae et Mercurii*). The work is in the form of an allegory. The bride, the learned maiden Philology, is received among the deities, only after a prolonged discussion. The seven bridesmaids are the seven liberal arts, as named above, each of whom gives an account of her own particular branch of knowledge. Thus in the form of a fantastic romance is elaborated the mediaeval scheme of knowledge. Though Capella's book was widely read in the early part of the Middle Ages (A.D. 480 to A.D. 524), Boethius's was of greater importance and of more all-round influence. He wrote the *Consolations of Philosophy*, perhaps the best known manual of the Middle Ages. He wrote current text-books on Aristotle's *Categorias de Interpretatione*, first and second *Analytics*, *Sophistici Elenchi*, and the *Topica*. And, besides, he produced the recognized text-books for arithmetic, music, and geometry. Boethius was the first to use the term *quadrivium*, and thus to differentiate between the two groups of studies in the Seven Arts. "The substantial distinction between the *trivium*, as an elementary course of study in language and discourse, as opposed to the

quadrivium, the later study of the sciences, emerges in his writings" (A. F. West). The *trivium* consisted of grammar, dialectic, and rhetoric. Whilst Donatus (*q.v.*) and Priscian (*q.v.*) were the authorities on grammar, in his presentation of Aristotle Boethius supplied the mediaeval text-books for dialectic or logic, and the elements of rhetoric. Cassiodorus (A.D. 480 or 490 to c. 575) fixed the Liberal Arts at seven, on the authority of Scripture, since seven is the perfect number (*e.g.*, Solomon says: "Wisdom hath builded her house; she hath hewn out her seven pillars"). He compiled the *de Orthographia*, from twelve grammarians, beginning with Donatus and ending with Priscian.

Following on the encyclopaedic lines of Martianus Capella and Boethius, Isidore, Bishop of Seville (c. 570-636), wrote his much vaster *Origines* or Etymologies. The contents are: Books I-III: Liberal arts; IV, medicine; V, law and chronology; VI, the Bible; VII, the heavenly and the earthly hierarchy; VIII, the Church; IX, language, peoples, and official titles; X, etymology; XI, man; XII, beasts and birds; XIII, the world and its parts; XIV, physical geography; XV, geography, buildings, etc.; XVI, stones and metals; XVII, agriculture, etc.; XVIII, vocabularies of war, law, and games; XIX, ships, houses, dress, etc.; XX, meats and drinks, tools and furniture. Of this book, Sir John E. Sandys says: "The work was so highly esteemed as an encyclopaedia of classical learning, that, to a large extent, it unfortunately superseded the study of the classical authors themselves." The Seven Liberal Arts, then, were fixed at that number by Capella, differentiated by Boethius into *trivium* (grammar, rhetoric, dialectic) and *quadrivium* (arithmetic, music, geometry, and astronomy); and the great storehouse of etymologies and reference books on this basis of the arts was that of Isidore.

The Importance of Dialectic. The Seven Arts remained the foundation of learning and culture during the time of scholasticism, and were only displaced by the broadening of the sciences after the insistence by Bacon on the appeal to a direct interrogation of Nature, and the employment of methods based on induction as well as deduction. (See BACON, FRANCIS.)

However exalted the position of grammar in the opinion of some writers, especially in the early Renaissance, it cannot be maintained that grammar was the chief of the studies of the *trivium*. The premier position practically, whatever may have been asserted theoretically by individual scholars, belonged to dialectic. Dialectic is the art *par excellence* which delights in systematization, in determining major and minor premises, and deducing conclusions, based upon generals which have no need of investigation, excepting, indeed, to subsume them under higher generals. Formal truth, not material truth, became the aim of the Mediaevalist. His universals were guaranteed by authority of the Church, or of Aristotle. All he had to do was to bring his particulars under the right species and the species under the right genus, and all under the guaranteed universal. Thought was thus certain, because authority barred out any diversity. Individuality of opinion was lost in a mental socialism, under authoritative dicta. Hence, dialectic afforded an excellent discipline for sharpening the mind, without opening it to investigate into the nature of phenomena, or its own validity. It provided endless subtlety of reasoning, without arousing

rationality. Such a training as dialectic, with authority as an encompassing circle, made the subject absorbing in interest, and both grammar and rhetoric could only be regarded as distinctly subsidiary helpmates, or even playmates, for they furnish the *ludicria* whilst dialectic has the *seria* for its scope.

Whilst dialectic was *facile princeps* in importance among the Seven Liberal Arts, it is equally certain that the best Mediaevalists were of opinion that the Liberal Arts themselves were but the preliminaries to higher studies. Theology, the highest of mediaeval educational goals, required many years of training; in the later mediaeval ages, when the University courses were instituted, fourteen years of study were required. But all aspirants to knowledge in the Middle Ages, in medicine, law, and even in the education of chivalry, were expected to be acquainted with the Seven Liberal Arts as a basis.

The supremacy of dialectic only slowly waned, even after the Renaissance. (See RENAISSANCE.) One reason for this was the autocracy of Aristotle. Aristotle's authority succumbed comparatively early after the Renaissance in physics and natural science subjects, for the new scientific knowledge rendered him obsolete. New writers wrote commanding works in grammar, rhetoric, music, arithmetic, astronomy. In geometry, Euclid claimed the next degree of prominence to Aristotle in dialectic. But geometry could not be applied to so many fields of knowledge as dialectic. As late as 1653, Crakenthorpe, in his *Logic*, declared that Aristotle "discovered, developed, and explained Logic, so that, in the course of two thousand years, no one has been able to either add to, or take away from, what he has said." In the seventeenth century, only the Ramists (see RAMUS) disputed this. Eventually, in general education, mathematics may be said to have taken the place of logic; literature and reading of authors to have reduced the survey of grammar and rhetoric; and the *quadrivium* to have expanded into a vast number of separate mathematical, physical, and biological sciences. F. W.

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ARUNDEL, ARCHBISHOP.—Lord Thomas Arundel, Archbishop of Canterbury (1396-1414), carried out the terrible task of enforcing the statute of 1401 (2 Hen. IV. c. 15), entitled *de comburendo haeretico*. It was a congenial task to crush what the Archbishop called "the new damnable brand of Lollardy"; and, in 1408, he supplemented the Act with provisions intended to root Lollardy out of the universities. The fourth of his constitutions forbade "masters and all who teach boys or others the arts, or grammar, and that instruct men in the first sciences," to teach contrary to the determinations of the Church, or to enter into theological discussions, or to read any book by Wiclif or others that had not been passed by the authorities at Oxford and Cambridge "under the discretion

of us, or our successors." To forbid men to read was the act which brought about the Reformation and the later revolution in England, and awakened the voices of Latimer and Selden. But the Archbishop's work was for the time effective, and the universities waned; though, in fact, it was Lollard influence that led to their revival at the end of the fifteenth century. J. E. G. DE M.

ASCETICISM.—The term "asceticism" is derived from *askēsis* (*ἀσκήσις*), the Greek name for the training undergone by athletes and wrestlers: it comprised a strict discipline over bodily indulgence. The Stoic philosophers used the same name for a mastery over the human passions and desires; and in the second century of the Christian era, the ascetic spirit led many Christians to separate themselves from the luxury and corruption of Roman cities and to retire to the solitudes of North Africa, where they lived singly or in small communities, chastening the flesh and purifying the spirit by abstinence from pleasure. Asceticism became highly esteemed, and Christian monasticism went far towards forwarding the progress of Christianity. As monasticism spread westward, mental occupation and physical labour were prescribed; and the monasteries, especially in Ireland, became schools of learning and training institutions for the clergy. There monks spent their time in copying manuscripts, and the scholars of the monasteries were the means of preserving many priceless masterpieces of ancient literature. The charitable work of these monasteries included the care of the poor, and to the monks the children of the poor owed their few opportunities of learning to read.

ASCHAM, ROGER.—He was born at Kirkby Wiske, Yorkshire, in 1515, and educated by Sir Humphrey Wingfield, his education including archery (as required by a law then in force). Sir Humphrey sent Roger Ascham to Cambridge University, where he entered St. John's College, and, after taking the bachelor's degree in 1534, he obtained a Fellowship in his college and became teacher of Greek in 1537.

In 1544 he wrote *Toxophilus* and, on presenting it to the King at Greenwich, was rewarded with a pension of £10. *Toxophilus* was one of the first scholarly books written in English, and in the preface Ascham explains his reason for not employing Latin or Greek. To write well, he says, it is necessary to speak as the common people do, and to write as wise men do; then every man will understand and wise men will approve. Many writers disfigured their work and made their books hard to understand by the introduction of strange foreign words, which he said was like mixing wine, ale, and beer at a dinner. He therefore wrote, in simple English, a scholarly book to encourage the practice of archery as a training for the defence of the country. The book is written in the form of a dialogue between Philologus (the lover of learning) and Toxophilus (the lover of archery), in which the latter argues that archery is a noble pastime, which adds strength to the nation and is very fit for scholars.

Ascham devoted much attention to music, and also excelled in penmanship. He taught penmanship to Edward VI, and in 1548 became tutor to the Princess Elizabeth. A reference to the manuscripts at the British Museum written by his pupils will show how they profited by his teaching.

In 1550 he became secretary to Sir Richard Morison, English ambassador to Charles V; and, as a result of a year's residence in Germany, he wrote a *Report and Discourse of the Affairs and State of Germany and the Court of the Empevor*. Although a Protestant, he was appointed by Bishop Gardiner as Latin Secretary to Mary, and retained the office under Elizabeth.

As the result of a discussion with Sir Richard Sackville on the severity of punishment inflicted on boys at school, and on the practice of sending boys out of England to be educated, Ascham wrote *The Schoolmaster*, in which he laid stress on gentleness in teaching, and defined the essential characteristics in the nature of a child with "a good wit for learning." *The Schoolmaster* was written during the years of failing health which preceded Ascham's death in 1568, and was published by his widow in 1570.

ASHTON, THOMAS.—Took his B.A. degree at Cambridge in 1559 or 1560, and was appointed master of Shrewsbury School in 1561, at a salary of £40 a year, with £8 allowed for his usher. The school was founded in 1551, but Ashton is generally considered its first head master, and almost as its founder, for by his exertions the greater part of its existing endowments were obtained, and he drew up most of the statutes and ordinances by which the school has been governed since his day. Ashton raised the school to a high position, and was himself held in high esteem by Elizabeth and her statesmen. His *Ordinances* contain regulations as to the number and salaries of the masters, the management of the school property, the internal affairs of the school, the hours devoted to work and to play, the games in which the boys might indulge, and the books that were used in the school. A picture of school life at Shrewsbury in those days, and for many years after, may be obtained from these ordinances. An important custom at Shrewsbury was the celebration of a Mystery Play at Whitsuntide. Ashton, who was himself a clever actor, arranged and superintended these performances with great taste and skill; and, in 1568, the play lasted all the holidays and was attended by the principal nobles and gentry of the neighbourhood. In the same year he resigned the headship, after having made the schools (as Camden says) the best filled in England.

ASIATIC SOCIETY, THE ROYAL.—The Asiatic Society of Great Britain and Ireland was founded in March, 1823, as an offshoot of the Bengal Asiatic Society. Other Asiatic Societies were then in existence in Bombay and Madras. Under the patronage of George IV, the title "Royal" was assumed, and the Society began with a membership of about three hundred.

The Society aims at the advancement of the knowledge about Asia, which it promotes by investigations into the races of Asia, their life and customs, occupations and literature. Researches are made into the mythology of the various races; and the progress of philosophy is traced westward through India, Persia and Arabia to Greece. A special study is made of languages and dialects and their associations, from Sanscrit, Chaldean and ancient Chinese down to their modern derivatives. In view of the growth of English dominion in the East and the importance of her East Indian trade, attention was from the first devoted to the countries of the south-east

of Asia and to the climate, peoples, and productions of the Eastern Archipelago. The members are divided into three classes. Those within 50 miles of London are called Resident Members, others are non-Resident Members. A limited number of foreigners are admitted as Honorary Members, if they have rendered distinguished service to the Society.

Members are entitled to use the Library and the Museum, and to receive the Society's publications as issued.

The earliest publications were *Transactions*, but after 1834 a quarterly Journal took their place. Volumes of Reports were published annually from 1823.

In connection with the work of the Society there is an Oriental Translation Committee, which has published many volumes.

The Society has branches in Bombay, Ceylon, China and Korea; and Associate Societies in Japan, Madras, Peking and the Straits Settlements.

The headquarters of the Society are at 22 Albemarle Street, London, W.1.

ASKE'S SCHOOLS.—(See LONDON CITY COMPANIES AND EDUCATION.)

ASSES' BRIDGE (*Pons asinorum*).—A name given to the fifth proposition in Euclid I, the first proposition to cause difficulty to beginners.

ASSIMILATION.—The physical process of making food liquid like the blood, so that it may combine with the blood; hence the mental process of absorbing knowledge.

ASSEMBLY HALL.—(See BUILDINGS, SCHOOL.)

ASSISTANT PROFESSOR.—(See PROFESSOR.)

ASSISTANT TEACHER (CERTIFICATED).—A certificated assistant teacher in an English public elementary school may be engaged either as a "class teacher," or as a specialist or "subject teacher." In the former case, he is in constant charge of a group of not more than sixty children, to whom he gives lessons in every subject of the curriculum with the exception of those which make special demands in the way of apparatus, accommodation, or knowledge: e.g., woodwork and metalwork (for boys); cookery, laundry, and housewifery (for girls). (See MANUAL TRAINING INSTRUCTOR DOMESTIC SUBJECTS, TEACHER OF.)

There are many advantages in the plan of having class teachers as compared with the system of specialists. If one teacher takes a class for a whole year, he can really understand his pupils and appreciate the capability of each one. He can adjust his lessons to meet their needs in a way which is impossible for the specialist, because he knows what the pupils are doing in all subjects. Correlation becomes easy, and can be sufficiently employed without undue strain. As no very great degree of knowledge in the academic sense is required in the teacher of the lower classes of an elementary school, but rather a knowledge of the pupils, this plan is beneficial to them. But when the teacher has no enthusiasm for learning, and regards teaching as a trade rather than as a vocation, it is a bad thing for the pupils to be deprived of the stimulus which contact with various adult minds can give.

The great advantage of having specialist teachers

is that there is much more likelihood of life in the teaching. If the teacher's knowledge is growing, if he is on the alert for new developments in knowledge or in teaching devices, his pupils must benefit from contact with him. It is unreasonable to suppose that anyone can keep in touch with modern developments in every branch of learning, or that any teacher can continually prepare fresh lessons in every subject. Consequently, the class teachers, unless they are privately specialists, are more likely than specialists to give each year similar lessons to those of the previous year, and to get into a groove.

An administrative plan of avoiding excessive routine for class teachers is to keep each teacher two years with a particular portion of the school work, and then to move him on to the next portion. This plan enables him to give to his pupils, in the first year, the benefit of his fresh preparation of lessons, and in the second to give the benefit of his experience in the first year.

Another feature of the "class teacher" organization is that each class has a room of its own (or, in older schools, a fixed portion of a room). This is convenient for the pupils, who can keep all their books together, and it tends to assist the development of a class *esprit-de-corps*.

Probably the true solution of this difficult problem of organization is a compromise between class teaching and subject teaching. If class teaching tends to routine because of the shallowness of the work, subject teaching tends to routine because of the narrowness of the outlook. A proper grouping of subjects, with specialists for teaching each group, and class teaching for the subjects within the group would appear to be the plan best suited to elementary schools.

Duties and Salaries. The duties of the certificated assistant teacher include the marking of the attendance register, and the clerical work connected with attendance, as well as the actual teaching of a class. He is responsible to the head teacher, and the head teacher correlatively is responsible for co-ordinating the efforts of the assistant teachers and for estimating their success.

Assistant teachers are appointed by the local education authority. In non-provided schools, the managers make a recommendation which has to be approved by the local education authority. An assistant teacher often holds his appointment on probation for the first three months, after which the engagement may be terminated by one, two, or (rarely) three months' notice on either side. The right to dismiss a teacher is seldom exercised by an authority; and, unless a teacher is not competent, or misconducts himself, he enjoys complete security of tenure. Even when a school is closed, the local education authority usually tries to find places for the dispossessed teachers.

In 1919, a Standard Joint Committee (the Burnham Committee) of representatives of local Education Authorities and of the National Union of Teachers met and drew up four standard scales of salary. The choice of scale was left to agreement between the authority and teachers concerned; the Burnham Committee coming in as arbitrators when agreement was not made within the specified time.

The salaries of assistant masters range by an annual increment of £10 or £12 10s. from not less than £160 to a maximum of £300 to £425.

The salaries of assistant mistresses range by an

annual increment of £10 to £12 10s. from not less than £150 to a maximum of £240 to £340.

A. C. C.

ASSOCIATED BOARD OF MUSIC, THE.—The Associated Board of the Royal Academy of Music and the Royal College of Music of London was established in 1889 in accordance with an agreement between the two institutions to act as their examining body for the purpose of conducting Local Examinations in Music. The Board was established under the patronage of the King, and the work is carried on by representatives of the two governing bodies and the teaching staffs of the two institutions.

The examinations of the Associated Board are of three classes—

1. School Examinations for individual certificates in four divisions: Primary, Elementary, Lower, and Higher. Students who have been taught privately may enter for these examinations. A general School Examination is held for a Report on the general teaching of a school, and there is also a Class Singing Examination.

2. Local Centre Examinations for individual certificates in two grades: Intermediate and Advanced.

3. Examinations for the Licentiate'ship of the Associated Board are held in Australasia, Canada, Malta, Gibraltar, Ceylon, and Jamaica; and candidates may enter as teachers or as solo performers of concert standard.

School Examinations. These are held three times a year, and any teacher or school may enter a candidate, or a parent or guardian may do so. The examinations are held at centres determined by the entries, and the practical part is arranged in circuits by the Board's examiners. The certificates are either *Pass* or *Pass with Distinction*. The subjects are as follows: Grammar of Music, Divisions I-II, Division III, Primary Practical, Elementary Practical, Harmony, Practical Subjects.

GENERAL SCHOOL EXAMINATIONS are held on application from schools, and the Examiner reports on any work submitted to him and may question the students on the work.

CLASS SINGING is examined, the examination lasting half an hour. Marks are awarded according to a fixed scale to indicate the proficiency of the classes under eleven separate heads.

Local Centre Examinations include (1) Theory; Rudiments of Music, Harmony, and Counterpoint. (2) Practical Subjects: Pianoforte, Organ, Violin, Viola, Violoncello, Double Bass, Harp, Wind Instruments, Singing. These are held in March and November. All candidates in Practical Subjects must also present themselves for Rudiments of Music, and separate certificates are given for each part of the examination. Exhibitions, medals, and prizes are offered annually for competition, as well as special prizes at certain centres.

Teachers' Certificates are awarded to successful candidates in Pianoforte, Organ, Violin, Singing and Theory. Candidates must pass the Advanced Harmony Local Centre Examination, the Advanced Practical Local Centre Examination, and the Final Teaching Examination. The Final Teachers' Examination includes Practical Tests; a written examination and a viva-voce examination in each division. Certificates for solo performers are awarded to successful candidates in Pianoforte, Organ, Violin, and Singing. Candidates must pass

the Rudiments of Music Local Centre Examination, and the Final Examination for Performers.

Licentiates are entitled to use the letters L.A.B. after their names.

The central offices of the Associated Board are at 15 Bedford Square, London, W.C.1.

ASSOCIATED CHAMBERS OF COMMERCE OF THE UNITED KINGDOM, THE.—The origin of chambers of commerce may be traced to the old trade guilds, whose work still survives in the hall-marking of the goldsmiths and the inspection of fish by the Fishmongers' Company. The first chamber of commerce was founded at Marseilles in the fourteenth century, and France appears to have become the home of chambers of commerce in the Middle Ages and later centuries. Other countries followed its lead, and in Great Britain the first Chamber was established by Royal Charter at Glasgow in 1783. The London Chamber of Commerce was not established till 1882, though, in 1860, London and Bradford merchants combined in forming a union of chambers of commerce in Great Britain, which still performs many useful functions. The great work of a chamber of commerce is to procure the latest trade and commercial information for the use of its members. Tariffs, rates and charges, customs duties, regulations as to commercial travellers in foreign countries, market prices, terms of credit, legislation affecting trade—these and many other matters, together with the collection and tabulation of statistics, engage its constant attention. Chambers of commerce are also useful in holding exhibitions of samples and patterns, and some continental chambers have commercial museums for that purpose.

Educational Work of the London Chamber. Commercial education is an important function of chambers of commerce, and in this respect the London Chamber has initiated a system of examinations which has been well supported by the commercial classes of the Metropolis.

Senior and junior courses of study are laid down to cover a period of three or four years, and examinations are held for the Chamber's commercial education certificates, prizes, medals, and scholarships. From the first, too, the London Chamber of Commerce has provided lectures and classes to cover the syllabuses and the examinations. Many of its lectures on the machinery of business have been attended by crowded gatherings of students. The examinations are held in London and in many provincial centres, and are carried out in co-operation with a number of other chambers of commerce, as well as city corporations and local education authorities.

THE JUNIOR EXAMINATION is intended for pupils up to 15 years of age in higher elementary and secondary day schools, or for young persons who have specially studied commercial subjects in evening classes. This examination includes as obligatory subjects: English essay, handwriting, arithmetic, a modern language, commercial geography, and commercial history. To these must be added at least two, and at most four, optional subjects, selected from (A), commercial arithmetic, book-keeping, advanced drawing, shorthand or stenotypy, typewriting, and political economy, or from (B) French, German, Spanish, Portuguese, Russian, Italian, Dutch, Esperanto, or at least two selected from (E) algebra, Euclid or geometry, trigonometry, or from (D) chemistry; sound, light, and heat; electricity

and magnetism; botany. A detailed syllabus in all the subjects is issued by the Commercial Education Department of the Chamber.

THE SENIOR EXAMINATION is suitable for persons over 15 years of age who can devote all their time to study up to 18 or 19 years. Here the obligatory subjects are: English, two foreign languages, mathematics, commercial geography and history, and political economy. Two optional subjects must be taken, selected from mathematics, business methods, banking, commercial law, book-keeping, chemistry, photography, drawing, shorthand, typewriting, and handwriting. Separate certificates are awarded in individual subjects, both junior and senior; and the full junior or senior certificate can be obtained by passing in a sufficient number of subjects at different examinations.

There is also a TEACHERS' EXAMINATION for a teachers' diploma. To obtain this, the candidate must pass in the required subjects of the senior examination, and also satisfy the Commercial Education Committee of his intention to teach the subjects stated on the diploma. The same papers are set in all subjects as for senior candidates, with additional questions for those taking the teachers' diploma.

THE TEXTILE TRADES' SECTION of the London Chamber of Commerce offers special prizes to candidates employed in London wholesale or retail drapery or hosiery trades as assistants if they pass sufficiently high in certain specified subjects in either the junior or the senior examinations. The examinations are usually held in the latter half of April and the first part of May. They are held at local centres provided in some cases by local chambers of commerce, and in others by education authorities and institutes. Prizes are awarded in the junior examination only to candidates under 17 years of age, except in the case of textile candidates, who are eligible up to the age of 21. There are no prizes in the teachers' examination. The Salters' Company awards annually a travelling scholarship of £25 to one junior candidate and a similar scholarship to one senior candidate. A large number of prizes of £1, £2, and upwards are awarded by the Chamber of Commerce, and many others by City companies and associations.

The office of the Chamber of Commerce and its Education Department are at Oxford Court, Cannon Street, London, E.C.

References—

- ROLLIT, A. *The Chambers of Commerce and their Functions.*
WELCH, C. *The City Guilds and their Relation to Commerce and Education.*

ASSOCIATION.—The term Association has a history almost as baffling as that of the word Idea. In general, it describes the elementary and common fact of recall. When I look at the photograph of a house where I spent a holiday, I recall not only the actual house, but, by Association, the various incidents and experiences of my stay. Such a fact is evidently of the first importance for the understanding of our mental life. It has a direct bearing on the process of *memory*; it furnishes us with material for our reflective and higher activities, and partially determines their direction. Plato (cf. *Phaedo*, 73 d.) noted this fact of Association, and used it in support of his general theory of knowledge. Since that time, the examination of it has occupied a notable place in the history of psychology

and epistemology. The conception of Association is peculiarly the special contribution of English thinkers to philosophical discussion. It is the dominating principle of the English empiricists from Hobbes to Mill, and most of them found in it the ultimate explanation of knowledge. For Hume, for example, the only discoverable unity of knowledge was that of the association of one impression or idea with another, because of their occurrence together. The final issue of Hume's doctrine in scepticism revealed the inadequacy of Association to serve as the basis of knowledge, and roused Kant to prove that Association itself implied some more ultimate or "transcendental" principle.

The failure of Association as an epistemological principle does not affect its value for psychology, although its use within this more limited province has often been marked by error. We cannot, for example, assume that we explain any sequence of mental events merely by calling it a case of association of ideas. That would be to convert what is simply a description of the fact to be explained into an explanation of the fact. The problem is rather to discover the conditions under which associative connections are formed and how their direction is determined. But it is convenient, first to describe in general the function of Association in the constitution of knowledge.

Association, in its widest sense, enters into both *perception* and *thought* (i.e., not only are ideas associated with one another, but Association is essential to the perception of external objects. Berkeley's proof of this is, in its main outlines, sufficient. In the *New Theory of Vision*, he shows that certain qualities which we "see" in objects are really not seen, but inferred, that is, "suggested" by our visual experiences in virtue of past associations. Similarly, tactual sensations are completed by the recall of visual and motor sensations. This inter-relation of our sense experiences is a first condition of the development of a perception of objects (cf. e.g., the account of the perception of space in STOUT'S *Manual of Psychology*, pp. 464-519). Even more conspicuously, at the level of conceptual or ideational process, Association is operative. The construction of chains of ideas, whence springs all progress in theoretical knowledge, plainly requires the possibility of recall. Memory largely depends upon this power of Association.

The investigation of the conditions on which Association depends raises two distinct sets of problems—physiological and psychological. As to the physiological conditions, our knowledge, though vague, is sufficient to lay down one general principle—that when two cortical cells have been excited, simultaneously or successively, a subsequent excitation of the one tends to spread to the other. Psychologically, we may distinguish at last four important conditions—

1. Percepts and ideas tend to recall one another according to their *proximity* in time. This is styled Association by Contiguity, and some psychologists regard it as fundamental. For example, the words "men may come" irresistibly complete themselves with "and men may go"; while if we hear the latter phrase first, we tend, though less strongly, to preface it with the former. Association, however, is selective, and we recall the most significant elements in a series.

2. The *order* in which our presentations come affects the manner of their recall, as the foregoing

example shows; while we know that it is more difficult, without much practice, to repeat the alphabet backwards than forwards.

3. The *recency* of our presentations is obviously important. The more distant they are, the harder and less certain is the process of recovery.

4. The effect of *repetition* is specially noteworthy, from its practical importance in memory-training. Ebbinghaus proved that the power of recall of a series of nonsense-syllables was more accurately and easily acquired if they were repeated a few times on each of several days, than if repeated many times all at once. The more the repetitions were divided, the more economical the process.

These four are the main objective conditions of Association, and all are always operative in some degree. More fundamental, however, is the direction of the subjective interest at the moment of recall. This primarily determines what shall be recalled and how. I try to recall the events of yesterday in order to decide what I was doing at a certain hour, and note that I was reading psychology. I remember nothing, however, of the details of the argument which I then followed. But if my purpose in recalling yesterday's events is to help the composition of this article, then it is those details that I recall most precisely. It is this condition, also, which most determines which of two competing lines of association I shall ultimately follow. Indeed, it is impossible to insist too strongly upon this condition; and most "associationist" controversies have sprung from its neglect. "Association marries only universals"; I recall those ideas and events that fit in with my purpose at the time of reinstatement. Hence, Association is ultimately governed by the principle governing all mental activity, viz., a mental state tends to work out its own fulfilment and completion. It is, in this sense, teleological.

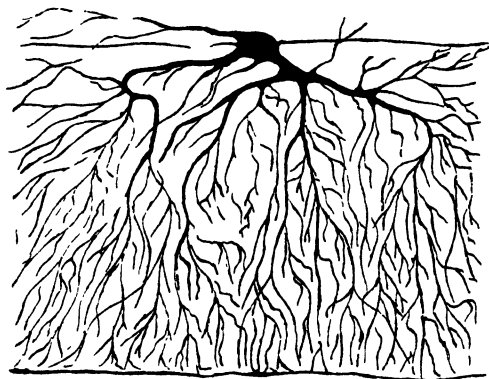
The literature on Association is immense, as every psychological text-book and review devotes much space to it. There are the various works of Professors Stout, William James, Hoffding, Bain, and Pillsbury, and Dr. Ward's article in the *Encyclopaedia Britannica*; while Professors Myers and Titchener give illustrative experiments. F. H. Bradley's *Principles of Logic* gives the logical implications. H. J. W. H.

ASSOCIATION, THE PSYCHOLOGY OF.—When two things are attended to together or in close succession, the recurrence to mind of the one, whether by renewed perception or by "thinking of it" again, tends to bring up the thought of the other. This fact is at the basis of all "learning by heart." The learner repeats words in a given order and, if later he starts with some of them, he is likely to be able to reproduce the others unaided. In such instances, it is not merely a case of *one* thing recalling *one* other, but of *many* things conspiring to the recall of *many* others.

All such connections are usually referred to under the name of *association*. The expression *association of ideas* is sometimes similarly employed, though it is somewhat misleading. For many things not usually called *ideas* are connected in the way described. All *habits*, for instance, are cases of association. Thus a sound may be associated with an action (e.g., the soldier's movement at the word "Attention!"). Association not only occurs between *ideas*, but these ideas themselves are often

the products of association. Thus the child's idea of a cat which becomes associated with the word *cat* is itself a whole compounded out of many simpler experiences. The child has seen and stroked the cat, thus obtaining definite sensations of sight and touch, and others more indefinite connected with his own movements in dealing with the animal (i.e., *kinaesthetic* sensations). He has heard it mew, and possibly felt its scratches. All these associated experiences form an aggregation now called the *idea* of the cat; and the recurrence of one of them will immediately revive traces of the others. The associations may be so strong that it is scarcely correct to speak of one element recalling another; there has been such a close fusion as to deserve a distinct name, so Professor Stout has suggested the term *complication*. The fixing of associations is the basis of all *memory* (i.e., the power to recall strings of ideas and to consolidate many of the ideas themselves).

Physical Aspects of Association. It seems to be generally agreed that the neurones or nerve cells



NERVE CELL FROM THE CORTEX OF THE
CEREBELLUM, WITH RICHLY-BRANCHING DENDRITES.
(After Kollicker.)

involved in each of the mental processes which become connected (every mental process involving a corresponding neural excitation in the brain) are brought into closer relations probably by the fine fibres springing from each nerve cell. These fibres, or *dendrites*, give off still finer branches or *arborizations*. And the arborizations of one neurone intermingle with those of others, such interminglings being usually called *synapses*. It is believed that nervous impulses or excitations are in some way transmitted from one neurone to another across the synapses, though the latter are not always *ready-made* connections. There seems, on the contrary, to be an increased resistance to the passage of impulses at many of these places. But, when once an impulse succeeds in passing across, it breaks down some of this resistance more or less permanently; so that the next time one of the neurones in question is in a state of excitation, the impulse will spread more readily.

No universally accepted answer has been given as to how the *first* passage of energy is secured. McDougall and others have adopted what they call the *Drainage Theory*. They suppose that when a given neurone is in excitation, it tends to attract or drain energy from any others at all excited, thus

increasing and continuing its activity. Now, this is the case when the neurones involved in one mental process (e.g., the perception of B) are excited immediately after those involved in another (e.g., the perception of A). For the excitations involved in the last-mentioned state have not completely subsided when the supervening excitations are aroused. Nervous energy is thus drawn through certain synapses, leaving a path more open than before. The openness of the path (i.e., the strength of the association) will depend on the amount of energy involved. If I am very strongly impressed by two things attended to in close connection, a single experience will suffice to form a permanent association. This is the case when great *interest* is aroused (e.g., the boy keen on county cricket can give the scores of the prominent players in a particular match after once reading them). Obviously, then, the more teachers can arouse their pupils' interest, the more ready will be the memorizing. Intense interest cannot always be aroused where strong associations are necessary (e.g., in the case of the multiplication table). *Repetition* may be necessary for the formation of such associations.

The foregoing process of association is sometimes called *association by contiguity*. Some psychologists distinguish contiguity in *place* from that in *time*; but, from the purely psychological standpoint, the former merely enables the two things in question to be perceived in *close temporal connection*.

Association by Similarity. The earlier psychologists made much of what they termed *association by similarity*. My grandfather's name recalls him to mind because the two have been previously associated by contiguity. But an old man now seen for the first time twenty years after my grandfather's death may also recall the latter. *Similarity*, we are told, is the bond in this case. If my grandfather has been dead twenty years, and I now see another old man for the first time, I can never have associated the two by virtue of contiguity. But let us examine the matter more closely. The eyes, the nose, the long, white beard of the old man now seen are practically *the same* as my grandfather's, and, being now re-presented, recall the rest of the whole which constitutes my grandfather. The association on which the recall depends is not, in this case, an association between the two separate individuals, but the connection which was inevitably formed among the various elements which constituted for me my grandfather. In the present old man, *some* of these elements now occur again, and these recall the others which were associated with them—by virtue of *contiguity*—twenty years ago. This close connection, which is formed among the various elements or aspects of one thing (as distinguished from the association between one whole and another separate whole), has been called, by Stout, *complication* (see above).

Not only do the cases usually cited as instances of "association by similarity" rest also upon contiguity, but the very thing (similarity) which is supposed to distinguish them from the cases, usually quoted as instances of association by contiguity, is also a feature—and, indeed, still more completely so—of the latter. As Lloyd Morgan says: "I think it may be said that *all* association is by contiguity, and that *all* suggestion is by similars, for we never have the same presentation twice, though it may on the second occasion be another presentation from what we call the same source" (*Psychology for Teachers*, p. 80).

Association by Contrast. Several other so-called forms of association have been mentioned by the older psychologists. *Black* suggests *white*; *good*, *bad*; *empty*, *full*; etc. It has been asserted that such instances are cases of *association by contrast*, whereas the bond is still *contiguity*. We can distinguish and thus abstract qualities by comparison of things possessing one quality in greater or less contrast with another. Now, the most striking contrasts occur when directly opposite qualities are in close proximity (*e.g.*, *black* stands out most clearly, and is hence most readily abstracted when contiguous to *white*). So with *good* and *bad*, etc. Since these qualities are most clearly distinguished when thus occurring, strong associations are formed by reason of this frequent *contiguity*. B. D.

ASSOCIATION.—(See FIVE FORMAL LESSON-STEPS, THE.)

ASSOCIATION.—(See MEMORY.)

ASSYRIA, EDUCATION IN.—(See BABYLONIA AND ASSYRIA, EDUCATION IN.)

ASSYRIOLOGY. THE TEACHING OF.—(See ORIENTAL EDUCATION IN GREAT BRITAIN.)

ASTASIA.—Usually an hysterical disorder, resulting in the loss of the power to walk or to stand.

ASTELL, MARY (1668–1731).—Advocated the right of women to education before Mary Wollstonecroft Godwin (1759–1797). She was the daughter of a merchant of Newcastle-on-Tyne, and was taught philosophy, logic, and mathematics by her uncle, a clergyman. After the age of 20 years, she lived at Chelsea. In 1694 she published *A Serious Proposal to the Ladies, for the Advancement of Their True and Greatest Interest*, followed, in 1697, by a second part, "wherein a method is offered for the Improvement of their Minds." Unfortunately, Miss Astell, who wrote anonymously as a "Lover of her Sex," called her proposed ladies' college a "monastery, or, if you will, a Religious Retirement," and this roused the keen opposition of Bishop Burnet, who said the institution would be reputed a "nunnery," and he therefore opposed the plan.

Views. Miss Astell's project combined religious motives with academic aspirations. She claims that women are as capable of training as men are. She wishes the proposed Retreat from the world to fit women to do the greatest good in it by enlarging "their minds." She urges that there are no accounts in history of so many great women as when they were educated in the cloisters between A.D. 1500 and 1600.

"Since God has given women, as well as men, intelligent souls, why should they be forbidden to improve them? . . . And as exercise enlarges and exalts any faculty, so, through want of using, it becomes cramped and lessened; if, therefore, we make little or no use of our understandings we shall shortly have none to use." Women should be educated to discover their own real duties. Many women learn the French language, but true educational direction would lead them to use it in the study of Descartes and Malebranche rather than by reading idle novels and romances. "Why should it not be thought as genteel to understand French philosophy as to be accoutred in a French mode?" The

religious training should be carefully developed, especially on the practical side of piety and charity. Public worship was to be "after the cathedral manner." The fasts of the Church were to be observed. Music and other diversions were to be followed. Friendships would be formed in such a community, the effect of which would react on the outer world as the members of the society mixed in it. Well-trained women will be available for better educating young children and for other social purposes. If it be objected that education will make women vain and assuming, the answer is "that a smattering may." It is the business of learning "never to speak but to the purpose." The husband who wins an educated wife is a much happier man on account of his wife's education.

In 1696, Miss Astell published, also anonymously, an *Essay in Defence of the Female Sex*, probably the best treatise on women's rights written before 1700. This is as important a treatise, educationally, as the *Proposal*. Miss Astell strongly advocates more solid training in the knowledge and use of the vernacular. Like Emerson later, she considers that translations can largely replace linguistic accomplishments, and praises the Earl of Roscommon, Mr. Cowley, Mr. Dryden, Mr. Congreve for their educational services in this direction. She urges that the name of learning is unjustly limited to Latin and Greek, and claims the title of learned for those who understand "perfectly" Italian, French, Spanish, High Dutch, etc., and who also know the history of those countries. She also recognizes the place in culture of modern philosophy, astronomy, geometry, and algebra.

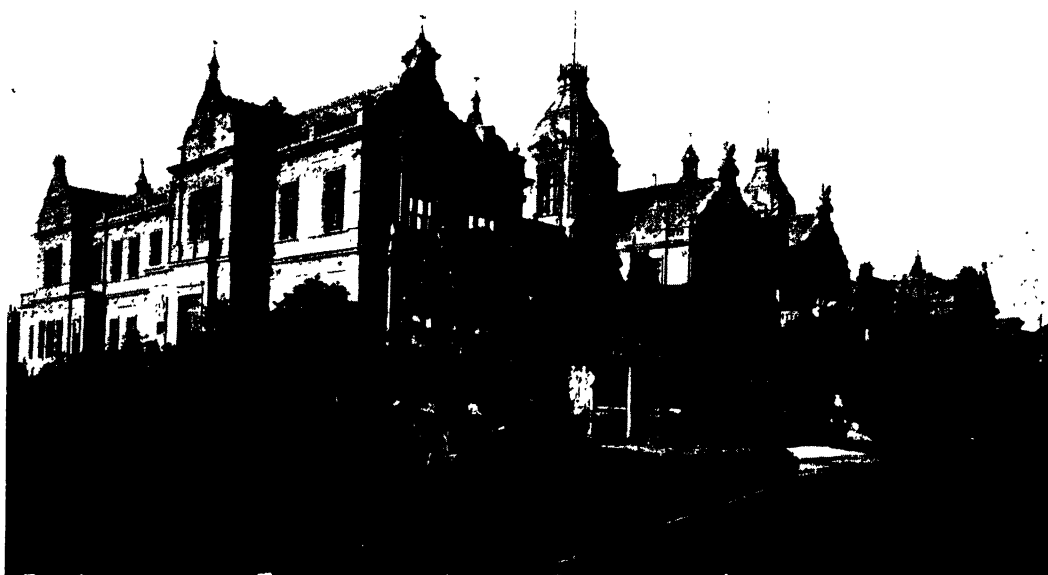
Perhaps the most striking comment on educational topics by Miss Astell will be thought to be her anticipation of Rousseau's appeal to Nature. She says: "I take Nature to be the first-born of universal learning." It is as ridiculous for a man to count himself more learned than another if he have no greater knowledge of things, because he is more versed in languages as it would be for an old fellow to tell a young one that his own eyes were better than the other's, because he reads with spectacles, the other without."

Criticisms. Miss Astell had to meet the attacks of *The Teller* (Nos. 32, 59, 63), who ridiculed her views by an imagined invasion of the "Religious Retreat" by the young Society beaux, who, by their flattery, win their way to kissing the maid, and even Madonella herself, the name by which the authoress is introduced.

It is remarkable that so little is heard of her incisive pioneer work on "Women's Rights": *Reflections upon Marriage*, 1700, urging that women might have other and "higher ambitions" than marriage.

Miss Astell made many friends, so varied as Queen Anne; John Norris of Bemerton; Lady Elizabeth Hastings (of whom Steele said: "To love her, is a liberal education"); Dean Hickey; Lady Mary Wortley Montagu, with regard to whom the well-known story is told that Miss Astell made the "solemn promise" that if departed spirits might re-visit earth, she would return to see Lady Montagu. The latter survived Miss Astell thirty years, but there is no record of the appearance of her friend to her.

Miss Astell wrote the Preface to Lady Mary Montagu's *Letters*, as issued in 1724, when characteristically she says: "I am malicious enough to



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desire the world should see to how much better purpose the ladies travel than their lords."

F. W.

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ASTIGMATISM.—(See EYESIGHT OF SCHOOL CHILDREN, THE.)

ASTROLOGY.—A science which for many ages was identical with astronomy, and of which one branch dealt with the movements of the heavenly bodies, and the other with the influence of those movements on the earth and its inhabitants. Astronomy was separated from astrology after the discovery, by Copernicus, that the earth was one of the members of the solar system, and that the sun was the centre of that system.

The sources of astrology must be looked for in very distant ages. The Chaldeans, Persians and Egyptians mapped out the year and the seasons by studying the movements of the heavenly bodies; and the religious systems of these and other ancient nations represented the constellations as the abode of the gods after they had migrated from the mountains, seas and groves of the earth. Thus arose the belief that the constellations of the Zodiac presided over and influenced all that went on upon the earth. The days of the week were dedicated to deities, and the Romans divided days into *dies fasti* (lucky) and *dies nefasti* (unlucky), according to their view of the influence of the presiding deities. After the belief in the gods had died out, the conviction that the stars exercised influence over the destinies of men still survived. Character was believed to be determined by the planets presiding at birth; and, even now, a person's temperament is described as saturnine or mercurial.

The chief use made of this science by its professors was to forecast events, especially in the life of man. For this purpose, the Zodiac was divided into three "houses" for each of the four ages of man—a cardinal, a succeeding, and a declining house. Disasters were foretold by certain combinations of planets in any of the "houses," while other combinations were considered auspicious. Eclipses portended misfortunes, and astrologers found a forecast of misfortune more reliable than one of good fortune. Most of the pioneers of modern astronomy were, at first, students of astrology, and in their researches discovered valuable truths. Both Tycho Brahé and his pupil Kepler made remarkable predictions in the course of their studies, and the latter discovered what are known as his "laws" as a believer in astrology.

ASTROLOGY.—(See ASTRONOMY, HISTORY OF THE TEACHING OF.)

ASTRONOMICAL SOCIETY, THE ROYAL.—The Astronomical Society was founded in January, 1820, by a small committee of eight persons.

Its objects were to promote the study of the stars and other heavenly bodies, and to collect information on astronomical subjects. The Committee of 1820 decided that all persons nominated and approved by themselves should be eligible for membership; and employed Sir John Herschel to draw up an address, which was circulated widely among scientific and other societies to explain the aims of the new Society. The Astronomical Society at once began to catalogue the stars; and to this end, Sir John Herschel spent some years in the Southern Hemisphere, and afterwards published, in 1847, a complete survey of the southern sky.

From 1827, the Society began to publish its *Monthly Notices* containing observations by its members and all the prominent astronomers of the nineteenth century. The *Monthly Notices* and Annual Reports provide a continuous history of the activities of the Society.

A collection of instruments and a library were formed at an early period. Medals were awarded to persons distinguished either for great inventions or for writings of merit, one of the early recipients being Sir John Herschel in 1836.

To the labours of the Astronomical Society we owe much of our present knowledge of the asteroids, the nature of double stars, comets, eclipses, and the surface of the moon. The Society obtained a Charter in 1830, and from that time has been known as the Royal Astronomical Society; its headquarters are at Burlington House, London, W.1.

Fellows may use the letters F.R.A.S. after their names.

ASTRONOMY, HISTORY OF THE TEACHING OF.—From the most remote antiquity, astronomy was the most practical of studies, since it was by it that all measurements of time and all directions at sea were determined. In mediæval times, astronomy was one of the subjects of the *quadrivium*. (See SEVEN LIBERAL ARTS.) The introduction of Arabic knowledge into Europe through Spain (see RENAISSANCE) intensified astronomical studies. The Renaissance emphasized the study of the Greek astronomer Ptolemy and his text-book, the *Μεγάλη Σύνταξις Τῆς Αστρονομίας*. The Arabs called it *μεγίστη* (the greatest); and the Arabic for "greatest" was *Almagest*, the name by which Ptolemy's book had become known in the Middle Ages. Ptolemy explained the motion of the planets and sun round the earth by a system of "excentrics" and "epicycles." The universe, it has been said, according to his view, was conceived of in the form of an onion with its rinds all fitting one over the other, and the earth in the centre. Such an interpretation led to the idea of the influence of the surrounding heavenly bodies on the earth bringing wind, rain, storm, and affecting man physically and mentally. Thus astrology as the theory of influences of heavenly bodies almost followed inevitably from the explanation of astronomy proper of the apparent motion of the heavenly bodies. Ptolemy (fl. c. A.D. 150) treated of astronomy in his *Almagest*, but he also wrote the *Tetrabiblon*, which dealt with astrology. The great Roman authority, who summed up the whole of the astronomical knowledge of his time, founded on Ptolemy, was Manilius (A.D. 1st century). The elementary mediæval text-book was Boethius (c. 480-524); and, in England, in the thirteenth century, wrote John of Holywood (or Johannes de Sacro-bosco), whose famous *Sphaera Mundi*

was written about 1256. It is a mistake to suppose that Ptolemy's application of geometrical treatment to astronomy is puerile. De Morgan considers that the mental discipline involved in mastering Ptolemy's system was great. Bologna was, perhaps, the chief centre of astronomical and astrological studies. Thus Cecco d'Ascoli both taught and supplied astrological horoscopes and judgments.

Modern Astronomy. Modern astronomy dates from Copernicus, who died in 1543, the year in which his *de Revolutionibus Orbium Coelestium* was published. In this work, Copernicus criticized the Ptolemaic theory, and suggested that the sun was the centre of the solar system, and the earth revolved round it. His theory was developed by Tycho Brahé (who died in 1601); Kepler in 1630; Galileo in 1642. Newton's *Principia* was not published till 1697.

The academic teaching of astronomy in England begins with the establishment of the Chair in Gresham College, by Sir Thomas Gresham, in 1596. In 1619, Sir Henry Savile founded the Professorship in Astronomy at Oxford. It is suggested that the professor is to teach the Ptolemaic theory, but he is debarred from professing the doctrine of nativities, and "all judicial astrology without exception." The first English public school to include astronomy in the curriculum was the Mathematical School of Christ's Hospital, established in 1673. After that time, astronomy was taught in English schools, principally in the private navigation schools (see NAVIGATION IN ENGLAND, HISTORY OF TRAINING IN) and in young ladies' academies of the eighteenth century, in lessons on the Globes.

Amongst the advocates of astronomy-teaching were J. L. Vives (*q.v.*), 1531, on the grounds of usefulness for navigation, and the calculation of seasons; Robert Recorde (*q.v.*) in 1556, in the *Castle of Knowledge*, apparently the first Englishman to accept Copernicus's new view; Lord Herbert of Cherbury in the first half of the seventeenth century; and John Milton (*q.v.*) taught astronomy in his school in Aldersgate Street, 1639-1646. F. W.

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ASTRONOMY IN SCHOOLS, THE TEACHING OF.—An astronomer who undertakes to write upon this subject is particularly faced with the difficulty that success in teaching Astronomy must necessarily depend upon the insight of the teacher into the really serious difficulties that must be overcome before the most elementary, and yet the most fundamental, truths of astronomy can be realized. It is easy enough to teach a number of interesting but disconnected facts; such as, that the surface of the sun is sometimes spotted; that the moon is a dead, cold volcanic world; that the stars are suns, like our own sun, but often bigger, brighter, and hotter. It may, perhaps, be doubted, however, whether a series of descriptive paragraphs, such as these might be, is of any marked educational value; and whether they are or not, they leave untouched the fundamental difficulty that a child who had acquired quite a catalogue of facts

of the purely descriptive kind might be totally unable to comprehend the causes of the every-day phenomena of night and day, of the rising and setting of the sun, of the seasons and of the seasonal variations of daylight. These are the real points of contact between astronomy and every-day life, and they are points upon which every person with the least pretensions to education should be fully informed. Yet it is probable that not one person in fifty could give a really clear idea of the reasons why the days are longer in summer than they are in winter, or of the constellations which might be seen equally in England and in New Zealand on a given month in the year.

Initial Difficulties. There is a very real difficulty which cannot be ignored in any attempt to teach these matters. For their understanding they demand a certain geometrical sense, which is hardly to be found in the majority of children or of their elders, or even, perhaps, of some of their teachers. In order to see whether a child is competent to learn, or a teacher competent to teach, the fundamentals of astronomy, I would propose that they should first undertake to explain the rotundity of the earth: that a man can live in any part of the earth without realizing that he is upon the surface of a sphere, and without any comprehension of the fact that the direction he calls vertically downwards is not parallel to the vertical of other people. One may suggest that, with the children, a beginning should be made with a lesson on the subject: "What we call downwards." We define this "direction downwards" as the direction in which weight will fall, or a pendulum will hang; and it is not difficult to proceed from this to the notion that "horizontal is at right angles to downwards," and that the surfaces of fluids at rest and the surface of the sea taken at large are horizontal. It is horizontal, but it is not flat. We must carefully draw this distinction as we proceed to learn the rotundity of the earth. How shall this be taught? At the seaside it is comparatively easy. Away from the sea, it is hard to discover any experimental method of showing the rotundity of the earth which is within the comprehension of the ordinary mind. Therefore, one must be content with explaining the phenomenon of the disappearance of a ship at sea, and with the assurance that the same effect takes place all over the world to very much the same degree; and that, therefore, the sailor can verify for himself that the earth is approximately of the same degree of roundness at every point. The landsman must be content to accept the statement of the sailor. He must also accept the traveller's assurance that, wherever one goes upon the surface of the earth, there is always the same experience of what downwards means, and always the same evidence that the level surface of water is at right angles to the downward direction.

Putting together these two notions—that the downward direction is at right angles to the surface of the sea, and that the surface of the sea is not flat, but round—one may proceed to the idea that the direction downwards and the direction of the force of gravity are determined by an attraction of the earth as a whole upon all parts of it, and upon all bodies in the neighbourhood of the surface; and that this is why the New Zealander feels no more astray than the Englishman, although their respective notions of downwards are very nearly opposite. To teach this successfully must

necessarily be very far from easy, because the roots of the argument lie a great deal beyond the comprehension of the child, and possibly beyond the knowledge of some teachers. There are complications which must be avoided, because they cannot be successfully faced in an elementary treatment of the subject; *e.g.*—

(a) The effect of the rotation of the earth.

(b) The fact that, though the earth attracts an external body as though it were concentrated at its centre, yet the direction of gravity on the surface of the not quite spherical earth is not directed towards the centre, but along the normal to the surface.

(c) The fact, which will strike any thoughtful person, that though a regular sphere may attract in the manner demanded, it does not obviously follow that the irregular earth, with its protuberant mountain masses and its deep seas, will necessarily do precisely the same.

These are varied instances of the very considerable complications which have to be avoided when one is trying to dispense a simple view of the principal phenomena of the earth and the relation of the latter to the sun and to the stars.

Introduction of Geometric Ideas. If, however, these initial difficulties have been successfully faced, and the pupil has been brought to realize that the immense earth is nearly a sphere, there should not be much difficulty in passing from the notion of downwards to the notion of upwards; and in showing that, if the sun is directly overhead at a given moment in one place or other, it cannot at the same moment be directly overhead anywhere else, and that what applies to the sun by day is equally applicable to the stars by night. At this point we must begin to emphasize the fact that the sun, the moon, and the stars are immensely far away compared with the size of the earth. This introduces a further tax upon the geometrical ideas of the child's mind, because what one would like to illustrate with a model cannot be thus illustrated in any satisfactory way. One would like to take a school globe to represent the earth, and the traditional candle to represent the sun. But, apart from the difficulty of conducting experiments before a class in a satisfactorily darkened room, the result must necessarily be unsatisfactory, because the intelligent pupil will immediately perceive that a school globe illuminated by a point within the room is illuminated over decidedly less than half its surface, and he will have to make further use of his intuition to realize that, if the source of light is sufficiently far off, the full hemisphere may be illuminated. It is just the old difficulty of understanding that from some points of view parallel lines may be considered to meet at infinity, while from other points of view they cannot.

Pass, then, to another essential conception: the prolongation of the plane of the earth's equator to the stars. We may ask the pupil to imagine a plane passed through the equator of the school globe and prolonged indefinitely until it meets the stars. But ask him further to try to realize that a parallel plane through some other point of the globe will, when prolonged, meet exactly the same stars and not a parallel belt of stars: then he must have a real instinct for geometry before he is convinced. If he has that instinct, he will see that the proposition, in its simplest terms, is not, as a matter of fact, absolutely correct; and he will have to learn, further, that, though not absolutely,

it is essentially correct even for the greatest refinements of astronomical work, because the angular diameter of the earth, as seen from even the nearest star, is a very much smaller angle than can be measured by any instrumental means whatever. The proposition is not, however, precisely true for the sun, and still less so for the moon; that is to say, that if the moon were on the celestial equator, as seen from the centre of the earth, it would not be on the celestial equator as seen from the latitude of London, but would be quite considerably south of it. One is, in fact, continually struggling with two conflicting ideas. The first, that the appearance of the sky and the positions of the sun and the stars with respect to the horizon are utterly different at different parts of the earth; and the second, that for many purposes the earth may be considered as a mere geometrical point in the Universe fulfilling Euclid's definition of a point as that which has no parts and no magnitude.

The Rotation of the Earth. Turn now to the question: "How shall we teach the rotation of the earth?" "How shall we make clear to the conviction of the average pupil what was strenuously denied even by the learned world until four hundred years ago?" Of experimental proofs there are none simple enough to be convincing. It is useless to appeal to the aberration of light, or to the pendulum of Foucault; to the equatorial bulge of the earth, or to the general circulation of the atmosphere, because to all intents and purposes these are as much matters of dogma as the doctrine of the rotation of the earth. But it is, at least, easy to demonstrate that either the earth is moving or the sun is moving, and even that elementary fact is worth establishing in an orderly way: for it is probable that, though comparatively few pupils would be ignorant of the fact that the sun rises more or less east and sets more or less west, yet there would be a great many who could not give a clear idea of what happens to the sun in the interval. Still less, possibly, will they have observed the difference between winter and summer rising, and the great difference between the winter and summer elevations of the sun at noon.

Nor is it easy to devise a course of experiments entirely suitable to schools. The necessary interval of six months between the summer and the winter phenomena is highly inconvenient; so is the fact that it is at least three to one that the sky will be cloudy at the time set for the lesson. It is, indeed, practically hopeless for a teacher in England to plan out a course of demonstration of even the simplest astronomical facts, but it would be of very real help to him if somewhere on the school premises there was a level floor and a pointed pillar. The path of the point of the shadow as it travels over the floor could be marked in some permanent way and dated, so that in course of time one can accumulate, by observation, the material for a lesson on the apparent path of the sun in the sky at different seasons of the year.

The Sundial. With patience one might, in time, go further and arrive by experiment at a species of sundial which has certain real advantages over the common form. Suppose, for the sake of simplicity, that the point of the shadow could be marked once a fortnight at 9 a.m., and the points joined by a smooth curve. From mid-winter to midsummer, the curve would progress towards the base of the pillar and would then return, but not along exactly

the same track. We should have discovered experimentally the equation of time (*i.e.*, the difference between sundial time and the ordinary mean time of civil life); and we should, at the same time, have constructed a sundial which would give mean time for one particular hour. Space forbids that we should pursue this experiment in further detail. It is, perhaps, improbable that there would be facilities for performing any such experiment at all in many schools; but the fact remains that, unless something of the kind can be done, there is little prospect of being able to teach by demonstration the most every-day facts of astronomy.

Star Knowledge. Consider now what can be done to teach a knowledge of the stars. Here the difficulties become extreme. From our deep streets, with brilliant lights overhead, the stars can hardly be seen. In the open country outside the town, there are real practical difficulties in conducting school classes after dark; and the teacher must needs be an enthusiast who finds opportunity to teach his pupils the constellation figures, though there is some chance of learning the winter constellations. An hour of a winter evening gives, at least, the opportunity of demonstrating two facts which may even be novelties: (*a*) that the stars rise and set as well as the sun; (*b*) that the stars around the north pole of the sky move, apparently, very slowly as compared with the stars on the Equator. We speak of stars rising and setting, but these things can hardly be seen in England, and certainly not in the neighbourhood of big towns. Let us preferably define the positions of the stars by the lines of conveniently placed roofs seen from carefully defined spots. Let us take every opportunity of recording the time at which stars rise or set above these roofs; and it will soon be possible to demonstrate that a star reaches a given place in the sky about four minutes earlier every evening, and arrives at the same spot again at the same time only after the lapse of precisely a year. From these facts, the keen and inspiring teacher will be able to deduce that (*a*) the sun is apparently moving among the stars; (*b*) the earth is really moving round the sun; (*c*) if we could see the stars at the same time as we see the sun, we should be able to realize more definitely this annual motion of the sun among the stars; and (*d*) the stars are always there, in spite of the fact that in the daytime we cannot see them.

But all these notions again demand a degree of geometrical insight which puts an equal demand both upon pupil and upon teacher.

The keen pupil will doubtless be interested in following the motions of the planets among the stars; and it is certainly no bad exercise in power of observation to set a class to mark down upon a simple star chart the position of Mars, or Jupiter, or Saturn, night by night, throughout a series of months. (Were there any demand for skeleton star charts, they could easily be supplied at a very cheap rate.) This exercise would have two advantages: Firstly, that it could be pursued by the pupils at home independently of the teacher; and, secondly, that the accuracy of the pupil's work could easily be checked by plotting on the chart the predicted places of the planets as given in the *Nautical Almanack*. The looped and twisted paths of the planets among the stars would put rather a strain on the mathematical knowledge of pupils and, possibly, upon that of some teachers; but the fact that the paths are so complicated and can be

predicted so perfectly must be highly instructive. Perhaps the *Nautical Almanack* is rather a heavy piece of equipment to demand; it must, however, always be remembered that there is much more than enough astronomy in *Whitaker's Almanack* to provide ample material for all school teaching of this kind.

The Telescope in Schools. The question is very often asked whether a telescope is desirable as an aid in teaching school astronomy. The answer would seem to be that it is very difficult to use a telescope effectively with a class. An enthusiastic master could teach two or three enthusiastic pupils a great deal; but he will find it very hard to teach thirty, especially in a climate like that of England, where it is often impossible to guarantee a sight of the sky at a given time. But a selection of good celestial photographs, such as may nowadays be quite readily obtained and at a reasonable price, is probably a useful thing, and serves admirably as an introduction to the more descriptive parts of the subject which we have not yet touched. If a teacher is interested in the subject, he will know some part of it well, and will make it interesting to his pupils; but it is little use suggesting what parts should be taken up, because everything depends on the taste of the teacher. In this descriptive part of the subject there is not likely to be much difficulty, as the difficulties present themselves in that elementary geometrical part, which is the foundation of the astronomy of every-day life and must not be overlooked.

A. R. H.

ASYMBOLIA.—Inability, or loss of ability, to understand signs of speech or to communicate ideas by signs.

ATAVISM.—The law of inheritance, by which the characteristics of an individual are transmitted to his (her) descendants. The nature and the extent of hereditary transmission of disease are by no means thoroughly known and understood. It is thought that the second generation tends to inherit the characteristics of the grandparents, and it is certainly possible for a mother to transmit to her children characteristics not manifested in herself. Good environment and favourable conditions may counteract bad heredity.

ATAXIA.—This is the term applied to want of co-ordinated control of muscular movement. It includes inco-ordination of any part of the voluntary musculature. All voluntary movement is primarily based upon external causes. In other words, such movement results from the receipt by the central nervous system of certain sensory impressions. These impressions travel up a sensory nerve from a peripheral end-organ (*e.g.*, the eye or the skin) to the spinal cord or brain. Motor impulses are generated from this central stimulation, and these pass down motor nerves to voluntary muscles; and movement is produced in direct response to the impression received. The mechanism so set in action is known as a sensori-motor arc. The adjustment in nature and degree of the motor response to the causative sensory stimuli is a highly important part of the physical education of the body in infancy and early childhood, and is continued throughout life in the acquisition of all forms of physical skill. Ataxia is the condition in which the controlled accuracy of the motor response is upset,

and this unbalancing is due to lesion of the sensory part of the sensori-motor arc. All sensory impressions play their part in this bodily control: *e.g.*, visual and auditory impressions, cutaneous impressions (ordinary touch, pain, pressure, etc.), muscular impressions (conveying information of the condition of contraction or extension of the muscle). Sensations from the trunk and limbs pass into the spinal cord, and up the posterior and outer lateral nerve columns to the brain. The sensory cerebral nerves convey the sensations received from the head and face direct into the brain.

In locomotor ataxia, the inco-ordination is due to the degeneration of the sensory parts of the spinal cord, and is shown in imperfect body balance and a stamping, unsteady gait. Thus the sensations of touch and pressure from the skin of the soles of the feet, and the sensory impressions from the muscles and joints of the lower limbs and trunk, are vital to the maintenance of body balance and of the proper movements of walking. In another progressive ataxia, the act of grasping exhibits, instead of a smooth, steady movement of hand and arm, an uncertain extension of the limb ending in a convulsive closure of the hand on the object. With increasing sensory degeneration, inco-ordination of movement becomes more marked.

The *semicircular canals* in the inner ear have special controlling powers over the balance of the head and neck particularly. Injury to one canal produces rolling movements of the head round an axis perpendicular to the plane of the canal. Injury to all the canals causes violent similar movements of the head and neck.

CEREBELLAR ATAXIA. The cerebellum is primarily an organ of equilibration. It is a highly specialized nervous structure, and is connected abundantly with all the sensory and motor tracts, being thus in intimate touch with all parts of the body. Surgical interference or rapidly developed disease produces a reeling, staggering gait. The cerebellum acts homolaterally. Slow disintegration of the cerebellum does not cause ataxia, muscular co-ordination being maintained by compensatory control from other parts of the brain. R. V. C.

ATHANASIUS.—Born at Alexandria about A.D. 296, he first came into prominence, while a deacon, at the Council of Nicaea (325) as the chief opponent of the Arian heresy. From about the year 321, Arius, an Alexandrian priest, Eusebius, Bishop of Nicomedia and others had been preaching the doctrine that the Son was not co-eternal nor of the same substance, with the Father. The Council of Nicaea, called to consider this Arian heresy, condemned its author, who was then banished to Illyria. On his recall Athanasius, now Bishop of Alexandria, refused to receive him into the Church.

Athanasius was tried for his treatment of the Arians, condemned, and banished for two years to Treves in Germany. He was recalled by the Emperor Constantine in 338, but a synod at Antioch again banished him, and he went to Rome, where his cause was upheld by many Italian bishops. The Western Emperor (Constans) secured his restoration to his bishopric in 349; but for the next six years continual attempts were made to obtain his condemnation, which was ultimately procured at the Council of Milan (355). He was expelled from Alexandria (356), and retired to the interior of Africa for six years. Under the heathen

emperor, Julian, he returned again for a time, but went back in 363 and spend most of the remaining ten years of his life in Egypt.

The period in which he lived was a very critical one in the history of the Church, of which Athanasius was a most able defender. The controversy arising from his contest with Arianism was the beginning of the separation of the Eastern from the Western Church, and the Church was torn internally by religious persecution and externally by attacks of heathen or semi-heathen emperors. Athanasius stands prominently as a leader, characterized by conscientious fearlessness, wisdom, and commanding intellect. He was one of the greatest orators of the Church. His powerful controversial writings are chiefly on the questions of the Trinity, the Incarnation, and the Divinity of the Holy Ghost. The Creed of St. Athanasius embodies the doctrines for which he contended, and was compiled some two or three hundred years after his death.

ATHENS IN HER PRIME.—The greatness of Athens in her prime is unique; there is nothing else in the history of civilized mankind that can be compared with it. Her prime may be reckoned from the Persian Wars to the Battle of Chaeronea and the Macedonian conquest (480–338 B.C.). And Athens was a small State—smaller than the least of the States of modern Europe. The free population, aliens as well as citizens, hardly amounted, at the time of its greatest prosperity, to a quarter of a million souls. Yet this handful of people, in a period extending to less than a century and a half, alike in literature and art, in philosophy and political institutions, attained to a level which has never since been surpassed. It is hard to say which is the more wonderful: that Athens should have attained to eminence in so many departments of human activity, or that she should have reached so high a level in each one of them.

Art and Literature. In art, the supremacy of the Athenian genius is uncontested. It is true that of the painting of the Great Age hardly a fragment remains; the vase-paintings being almost the only material on which we can form a judgment. But few would be found to question the claims of Athens in the sphere of sculpture and architecture. Here, again, we have little more than fragments to guide us, but those fragments are sufficient. Not a single statue dating from this period is complete; not a single temple is standing that is not more or less in ruins. It would be hardly too much to say, however, that if we had nothing but the Elgin Marbles and the Hermes of Praxiteles in sculpture, and nothing but the Parthenon and the Propylaea in architecture, left to us, our verdict could be given without hesitation. The zenith of Athenian architecture may be put in the fifth century B.C., the age to which the Parthenon belongs. The prime of sculpture extends to the fourth century as well as the fifth. In the fifth century the greatest name is that of Pheidias, in the fourth that of Praxiteles. In the age of Pheidias, however, sculpture is still the handmaid of architecture; in the age of Praxiteles, it has become an independent art. In literature, although much has perished, much has come down to us intact. Consequently, in literature we have ample materials for a judgment. In poetry, the zenith was attained in the fifth century; in prose, in the fourth. At Athens, poetry means the drama: the

great names in epic and lyric poetry are to be looked for elsewhere in the Greek world. It is from the drama of Athens, both tragedy and comedy, that the drama of all other ages and countries is ultimately derived. Aeschylus, Sophocles, and Euripides are the great masters of the tragic art; Aristophanes is the greatest name in comedy. It may be conceded that Shakespeare is greater than any one of these; what cannot be questioned is that in no other period of civilization have there appeared so many poets of the first rank at the same moment. In prose, the originality of the Athenian genius is as clearly seen as in poetry. The "Father of History" is Herodotus; and although Herodotus was not an Athenian by birth, he wrote at Athens, for an Athenian public, and in the Athenian interest. Thucydides is the Father at once of critical history and of contemporary history. History has originated independently only at two centres: at Jerusalem and at Athens. But the historical writing of the modern world goes back, through the Latin historians, to the great Greek writers, and not to the Old Testament. In two other branches of prose writing—rhetoric and philosophy—it was the work of Athens to bring to perfection what had been originated elsewhere in Greece. Rhetoric was not an Athenian invention, but it was in the practice of the Athenian courts of law that it was developed; and the great orators, of whom the most famous are Isocrates, Demosthenes, and Aeschines, were almost all Athenians. In philosophy, too, hardly any of the earlier thinkers were Athenians; yet the two greatest names in the history of philosophy are those of Plato and Aristotle, the former of whom was an Athenian in every sense, while the latter, though not an Athenian by birth, spent the best years of his life as the head of a school of philosophy at Athens. It would be difficult to exaggerate the influence of Athenian oratory and Athenian philosophy upon the intellectual history of mankind. The oratory of the modern world goes back to Cicero, and Cicero had learnt his art from the great Athenians. It would be superfluous to insist on the influence of Plato and Aristotle through Roman times and the Middle Ages down to the present day. In the last thirty years, especially in this country, the sanest thinkers have found their inspiration in a return to one or other of these two. What should never be forgotten is that, alike in literature and in art, Athens supplies both the inspiration and the models. It is not merely that we go back to Athens for the beginning of the process; it is at Athens that we find the fully developed form.

Politics. To many minds it would appear that the Athenian genius is pre-eminent, not in art or letters, but in the sphere of politics. At any rate, the constitutional history and the constitutional system of the Athenian state should possess a peculiar interest for the present age. For the Athenian democracy is the first example in history of a great democracy; it is also the first example of an imperial democracy; and in its fully developed form it exhibits the most perfect instrument of popular government that has ever been devised. The Athenian democracy was the creation of the Athenian statesman Cleisthenes, towards the end of the sixth century B.C. It was he who laid down the principles of the constitution; to carry those principles to their logical conclusion was the work of Pericles, one of the most famous statesmen of

all time. If we mean by democracy government by the people; if, in other words, we mean a system in which every citizen, however humble, has the right to make his voice heard, and gets his chance of taking a part in the work of administration, a system in which the great mass of the citizens do actually take part in such work, then it would pass the wit of man to devise a more perfect instrument of the popular will than the Athenian democracy. The fundamental principle of the constitution was that of the initiative of the individual. Any member of the Council, a body of 500 chosen by lot, could propose any measure he pleased, so long as it came within the limits of the constitution. Any citizen could exercise the right of criticism in the Assembly, and could propose any amendment to any measure proposed by the Council. Not only was every citizen eligible for election to all the offices of State, but—what is more important—he had the opportunity of attaining to them. All offices, with the exception of the military commands, were appointed to by lot and were paid; and for no office was any qualification required, either of birth or wealth. An official career was open to all the citizens. If a citizen had any political ambition, even if he came from some remote country village, he was certain, sooner or later, to be chosen by lot as *demarch*, or mayor of his native place. As the representation in the Council was by the *demes*, or parishes, he could count on obtaining a seat in the Council. During his year of office in the Council he would become familiar with almost every department of the business of state, both legislative and administrative. If he wished for a further career, he might hope to hold, in turn, several of the numerous magistracies. It is probable that at least half of the citizens, at some period or other of their lives, had either sat in the Council or held some magistracy. In this way, the ordinary Athenian obtained an insight into the work of government, and received a political education such as falls to the lot of only a select few in any modern state, however democratic. It must be remembered, too, that the control of the sovereign people extended to the Executive and the Judiciary. The highest officers of state were responsible to the Assembly, from which they received their orders, and by which they could be suspended. Justice was administered by popular courts of law, which numbered as many as 500 or 1,000 jurors. There was no presiding judge to sum up, and the jury decided on points of law, as well as on questions of fact. In spite, however, of the rigorous control which the people exercised over its officials, the Athenian democracy succeeded in avoiding a danger which has proved fatal to most other democracies. During the period of her greatness, Athens was ruled by men of genius. It is not until her greatness has passed away that her policy is directed by mediocrities. It was thanks to these men of genius that Athens won her empire. Judged by our modern standards, that empire was insignificant. But if we weigh as well as count; if we bear in mind that it included some 250 city-states, each of them like Athens herself, a democracy, each of them a community in which the level of political intelligence was incredibly higher than that of any modern state, we shall form a very different estimate of its importance. The empire was the work of three men. Themistocles created the navy, without which the empire could neither

have been won nor held. Cimon, by his victories over the Persians, extended the empire to the whole area of the Aegean Sea. It was left to Pericles to organize what Cimon had won. The empire was founded in 478 B.C., after the repulse of the Persian invasion; and it was lost after the defeat of Athens by Sparta at the Battle of Aegospotami, at the end of the Peloponnesian War (405 B.C.). That a great empire should have been administered with success by an assembly of the whole people is, perhaps, the most wonderful fact in the history of Athens. Lastly, it may be worth while to point out that life at Athens was as democratic in spirit as the constitution itself. At Athens, as in every society known to history, there were differences of wealth; but in no other society can the poor man have been at so little disadvantage as compared with the rich. The simple wants of a southern population were so easily satisfied that less than sixpence a day was considered sufficient remuneration for a jurymen, and less than a shilling a day sufficient for a member of the Council. In all those aspects of life that constitute the claim of Athens to greatness, the poor man was on a footing of equality with the rich. Equally with the rich man he could listen to the masterpieces of the dramatists and the orators, or take part in the religious festivals, or view the temples and statues. Even the teaching of the great philosophers was given gratuitously. Nothing, perhaps, is more significant of the tone and temper of Athenian life than the influence of Socrates. He was a working man and extremely poor, yet he was the friend and teacher of the wealthiest and most highly born, and no other teacher so profoundly affected the Athenian spirit. To the societies of the modern world, with their material civilization and material aims, Athens, in her prime, presents a striking contrast. In the greatness of Athens we have an example of a greatness which was purely intellectual, and of a progress which, though astonishingly rapid, owed less than nothing to material conditions. Athens achieved much; but whatever she achieved, was won by the unassisted efforts of the human mind.

E. M. W.

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ATHENS, EDUCATION IN.—(See GREEK EDUCATION.)

ATOMIC THEORY, THE.—The view that the extraordinary multiplicity and variety of phenomena which we observe in the material world are to be ascribed to the motions, aggregations, and dis-aggregations of minute indestructible particles, *atoms*, varying in size and shape, is usually associated with the names of the Greek philosophers Leucippus and Democritus (c. 460–360 B.C.). But only the merest fragments of the writings of Democritus have come down to us; and, in spite of the account given by Aristotle, we really know practically nothing about his atomic philosophy. At a later date, these atomic speculations appear to have

been revived in the philosophy of Epicurus (341–270 B.C.), whose theory of natural phenomena was expounded in the Latin poem *De Rerum Natura*, written by the Roman writer, Titus Lucretius Carus (98–54 B.C.). But, beautiful and imaginative as the poem of Lucretius may be, it is not possible to extract from it any clear conception of the facts and theories which constituted the Greek atomic philosophy.

The revival of the atomic theory in a practical form we owe to the genius of John Dalton (1766–1844), although the view that matter may consist of very small particles (not necessarily indivisible) was held by Francis Bacon (1561–1626) and by René Descartes (1596–1650), and was expounded by Pierre Gassendi (1592–1655).

Dalton appears to have formed the theory that matter consists of small discrete particles in order to explain certain physical phenomena relating to the intermingling of gases and the varying solubilities of gases in liquids. But it was his application of this theory to the explanation of the quantitative laws relating to the chemical combination of elementary substances which first drew attention to the value of the theory. In contradiction of a view expressed by the French chemist Berthollet, his fellow-countryman Proust had conclusively demonstrated by experiment that, when two elementary substances combine chemically to form a number of definite compounds, these compound substances do not form a *continuously varying series* with regard to the proportions of their elementary components. On the contrary, each compound has a definite composition characteristic of it and finitely different from that of the other compounds. In the homogeneous *continuum* of continuous variation which the mind might conceive as possible, the definite pure compounds which we can actually obtain stand out as discontinuous points—as *individuals*. We encounter here those fundamental facts of *individuality* and *discontinuity* which are so characteristic of chemical phenomena, and which distinguish them from that wide range of physical phenomena which are, or which appear to be, susceptible of continuous variation (though, indeed, the idea of discontinuous variation is rapidly making headway in many branches of modern physical science). The mathematical science of the eighteenth century was ill-adapted to deal with the concept of discontinuous variation. The genius of Dalton lay in perceiving that the concept of atoms might provide the necessary weapon. The *Law of Multiple Proportions* was the first triumphant fruit of this conception. Put into its most general form for two constituents, this discovery (announced publicly by Dalton in 1803–1804) states that, if we determine the compositions of the different compounds of two elementary substances, the masses of one constituent which combine with a constant mass of the other constituent bear ratios to each other which can be expressed by the ratios of a series of *small whole* numbers. Now, these facts could be accounted for, if we made the following hypotheses—

1. Each elementary substance consists of small particles, atoms, all possessing the same constant mass. This mass is different for different elementary substances.

2. Chemical combination consists in the combination of these atoms, which in this process preserve their individuality and are not changed in mass, either by subdivision or otherwise.

3. The different chemical compounds so produced are characterized by the nature and number of the atoms which they contain.

4. Chemical compounds are relatively simple, *i.e.*, the numbers of the atoms of the elementary substances contained in each "*compound atom*" of the compound substance are relatively small.

Such, in brief, were the hypotheses underlying Dalton's application of the atomic philosophy. They afford an entrancing vista into the hidden "machinery" of the material world, and awaken the hope that by their aid we shall be able to determine the relative masses of the atoms of elementary substances and the *atomic compositions* of compound substances. But a moment's consideration will show us that this is not possible without the employment of arbitrary rules. Let us take the case of water as an example. Cavendish and others had demonstrated that water is a compound substance, composed of the elementary substances which Lavoisier subsequently named hydrogen and oxygen. We know now that 7.94 parts by mass of oxygen combine with 1 part by mass of hydrogen to form 8.94 parts by mass of water. If we assume, as Dalton did, that the "compound particle" of water contains 1 atom of hydrogen and 1 atom of oxygen, and write its *formula* (in the manner subsequently suggested by Berzelius) HO , where the initial letters indicate atoms, then it follows that the mass of the atom of oxygen is 7.94 times as great as the mass of the atom of hydrogen. But an arbitrary rule of *simplicity* is here involved, which renders these results uncertain. And, as a matter of fact, we know nowadays that water contains two atoms of hydrogen for every atom of oxygen, and so we write its simplest formula H_2O ; from which it follows that the mass of the atom of oxygen is 15.88 times as great as that of the atom of hydrogen.

These uncertainties greatly diminished the practical application of the atomic philosophy as suggested by Dalton, which, though it found many upholders (one of the earliest of whom was Thomas Thomson, Professor of Chemistry at the University of Glasgow), was long rejected by many of the most eminent chemists. During this time, the *formulation* of the facts relating to the compositions of chemical compounds passed through a period of great diversity, and, indeed, confusion. From this the science of chemistry was ultimately rescued by the establishment of a new set of ideas, which we now term the *molecular* theory. Let us very briefly indicate the train of reasoning and experiment involved in this advance, one of the greatest that chemical science has ever made. At the instigation of Humboldt, the French chemist and physicist Gay-Lussac had shown by experiment that, when gases were involved in a chemical change, the ratios of the volumes of the reacting and resulting gases (compared at the same temperature and pressure) could be expressed by the ratios of *small, whole* numbers. Thus, when hydrogen gas and oxygen gas combine to form water without residue of either reactant, then, if we work at such a temperature that the water remains in the gaseous state, Volume of hydrogen: volume of oxygen: volume of dry steam = 2 : 1 : 2. This very remarkable discovery at once suggests some connection with the atomic theory; and, indeed, Gay-Lussac indicated that it would follow at once from Dalton's atomic theory were we to suppose that equal volumes of gases measured at the same temperature and pressure

contain equal numbers of atoms (whether simple or "compound"). But Dalton rejected this hypothesis, since it did not harmonize with his conception of atoms, which he supposed to consist of material nuclei surrounded by atmospheres of *caloric* (the substance of heat) of very different sizes in the case of different atoms. But, what is of greater importance, the Italian physicist Avogadro pointed out that such a hypothesis would lead to the conclusion that atoms can be further subdivided in chemical changes. Thus, referring to the case of the formation of steam quoted above, it would follow that two atoms of hydrogen combine with one atom of oxygen to give two "compound atoms" (particles) of steam, each of which latter must, therefore, contain half an atom of oxygen. In order to obviate this difficulty, Avogadro suggested that equal volumes of gases measured under the same conditions may indeed contain equal numbers of *particles*, but that these particles need not in the case of elementary substances consist of single atoms, but may be *groups or clusters of chemically combined atoms of the same sort*.

Thus, if we suppose that the particles of hydrogen gas and of oxygen gas consist of pairs of like atoms combined together, which we may formulate thus: H_2 , O_2 —we can infer from the volume-relationships that two particles of gaseous hydrogen combine with one particle of gaseous oxygen to form two particles of dry steam, which action we can now formulate as follows: $2\text{H}_2 + \text{O}_2 = 2\text{H}_2\text{O}$. We are thus led to the further conclusion that the compound particle of steam contains two atoms of hydrogen combined with one atom of oxygen. This hypothesis of Avogadro not only explains Gay-Lussac's *Law of Volumes*, but preserves the essential ideas of Dalton's theory. It introduces the new idea that elementary substances may be in reality *self-compounds*, composed of Daltonian atoms of equal mass and apparently similar character. In this remarkable and bold concept we perceive the creative work of an imaginative mind.

The particles referred to by Avogadro we now term *molecules*, and Avogadro's assumption that equal volumes of gases under like conditions contain equal numbers of molecules provides us, as Avogadro pointed out, with a method of comparing the relative masses of the molecules of elementary or compound substances. For the ratios of the gaseous densities will give us the ratios of the molecular masses.

It was a long time before the full extent and importance of Avogadro's ideas were recognized. We owe this to the Italian chemist Cannizzaro, whose systematic and logical development of his compatriot's ideas was first publicly made known and understood in 1860. It was this work of Cannizzaro which finally gave a secure basis for the practical application of Dalton's atomic theory. Taking the atomic mass of hydrogen as unity and its molecular mass as two we can determine by Avogadro's method the relative molecular masses of various substances in the gaseous state (provided these substances can be converted into vapour without decomposition). If a number of compounds (as many as possible) containing a given element be chosen, we can therefore determine the masses of this element contained in the relative molecular masses of these different compounds, provided we determine their compositions and relative gaseous densities.

The masses of the element in question so

determined are found to be *simple multiples of a certain number*, which is therefore either the relative atomic mass of the element or a simple multiple of it. If the number of compounds examined be considerable, the former alternative will, with great probability, be the correct one. Such, in brief, is the Avogadro-Cannizzaro method, on which the whole atomic-molecular system of modern chemistry is based.

We have seen that the Greeks supposed the atoms to be in motion. The theory that the molecules of gases are in a state of rapid irregular translatory motion was greatly developed in the nineteenth century, this development being due chiefly to the work of Waterston, Joule, Krönig, Clausius, Clark-Maxwell, and Boltzmann. This theory (termed the Kinetic Theory of Gases), together with other later developments in physical science, has led to a greatly increased knowledge of atomic and molecular magnitudes. We know now that the actual number of atoms contained in a "gram atomic" mass of any elementary substance (*i.e.*, its relative atomic mass expressed as grams) is the enormous number 7×10^{23} , that is to say, very nearly a *billion billion*. Hence we know the *actual masses* of the atoms. Thus, the actual mass of an atom of hydrogen is about a billion-billionth of a gram.

We know also the mean velocities of the molecules of a gas under specified conditions, and the approximate *sizes* of molecules. Thus, the average velocity of translatory motion of a molecule of hydrogen gas at 0°C . is about 1,700 metres per second; whilst the "diameter" of a hydrogen molecule is of the order of magnitude of $2 \times 10^{-8} \text{ cm}$. (*i.e.*, one fifty-millionth of a centimetre). What a marvellous insight into the structure and "fine mechanism" of the material world a century's progress in physico-chemical science has yielded! The nature, number, and relative arrangement of the atoms contained in the molecules of many of the most complicated organic substances are now known to us, thanks to the patient and untiring work of chemical investigators. But we know as yet very little concerning the relative *motions* of the atoms in these molecules or the forces which hold them together. This will be the work of the present century, and the goal to which it is leading us is the unravelling of the mystery of *living matter*.

Finally, the discoveries of the last eighteen years—discoveries associated chiefly with the names of Becquerel, Professor and Madame Curie, and Professors Rutherford, Ramsay, Soddy, and Debiere—have shown that elementary substances exist whose atoms are steadily *disintegrating* into simpler atoms and into atoms of electricity (called *electrons*). We now know—a fact long suspected—that the atoms of elementary substances are themselves complex structures compounded of still finer and more subtle components, one of these being electricity. It is probable that the atoms of the elementary substances known to us are the products of a long process of evolution, beginning perhaps with the simpler substances which the spectroscope has revealed in the distant gaseous nebulae and "early" stars. But is there any beginning, and any end?

Hitherto it has not been found possible with the means at our disposal to arrest or alter in any measurable degree the process of steady disintegration occurring in the atoms of the "radio-active" elements (*e.g.*, radium, thorium, uranium, etc.). Nor has it yet been found possible to detect or initiate a similar process of disintegration in the

case of the majority of the elements known to us. Furthermore, it has not been possible to *reverse* this process (*i.e.*, to build up or synthesize atoms from their components). These all remain the great problems of the future.

Physico-chemical science is progressing and expanding in two apparently opposite directions, towards the simple and towards the complex; towards the problem of the structure and mechanism of the atom, and the structure and mechanism of the living cell. The keynote of modern investigation is the study of *discontinuity*, the study of *individuals*. For this we shall require a new mathematics and a new philosophy. And in this new revelation will be found the solution of many of our ancient puzzles. The intuition of the atomists has indeed triumphed. F. G. D.

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ATROPHIC RHINITIS.—(See NOSE, THE HYGIENE OF THE.)

ATROPHY.—An alteration of the vital processes of a living organism, resulting in a decrease in size and in the activity of the organism. It is caused by lack of nourishment, waste of tissue, paralysis, and certain poisons; and is frequently due, in a general sense, to inactivity. Disease and injuries are common causes; old age produces general atrophy.

ATTENDANCE, COMPULSORY.—By the Education Act of 1870, England and Wales was divided into school districts; and by Lord Sandon's Act of 1876, Attendance Committees were formed in every district outside the areas of School Boards. In rural districts, such committees were formed of members of the Boards of Guardians, and in boroughs and towns they were appointed by the Town Councils or Urban Sanitary Boards. The business of the School Attendance Committees was to compel children to attend school, and the managers provided the committees with returns of irregular attendance. The committees had "powers" to enforce regular attendance, but were not compelled to use their powers. Mr. Mundella's Act of 1880 required Attendance Committees and School Boards to make bye-laws for compulsory attendance and to carry out those bye-laws. Many School Boards sent a warning notice to parents in cases of irregularity reported by teachers and attendance officers; and, if this continued, the parents concerned were invited to meet the committee. If, after an interview, the irregularity continued without a satisfactory reason, the parents were summoned to a police-court; and magistrates had the power to inflict fines and, in bad cases, to send children to Truant Schools. By the Acts of 1902 and 1903, the Local Education Authorities took over the work of the School Boards and Attendance Committees; and each Local Education Authority now makes its own bye-laws and has its own system of enforcing the compulsory clauses of the Education Acts.

ATTENDANCE OFFICERS.—These are employed by education authorities to enforce the clauses of Education Acts in regard to compulsory attendance of children at elementary schools. Before 1902, School Boards employed these officers, who worked in conjunction with the teachers of all schools within the areas of the School Boards. In areas not ruled by a School Board, the duty of enforcing attendance devolved upon Boards of Guardians, and little was done. By the Acts of 1902 and 1903, school attendance came under the control of local education authorities, who appoint attendance officers. These officers visit their schools at regular intervals, take lists of absentees, visit the parents, and, in doubtful or serious cases, call them to meet school managers. They also take out any necessary summonses, attend police-courts to substantiate the charges, collect fines imposed, and undertake the removal of children to truant schools and reformatories.

ATTENTION.—According to what may perhaps be called the traditional view, Attention is, primarily, an intellectual process. A boy is said to be attending when his mind is focused upon the ideas which form the subject-matter of the lesson; as, for instance, when he is listening to the master's explanation. The selected ideas to which attention is given gain in clearness. The boy "understands" [see e.g., Bagley: *Educative Process* (p. 96)]. This conception of attention has been developed by distinguished psychologists and, undoubtedly, throws light upon important features of the process. "The problem of attention centres in the fact of sensible clearness" [Titchener: *Psychology of Feeling and Attention* (p. 182)]. "The essence of attention as a conscious process is an increase in the clearness of one idea or group of ideas at the expense of others" [Pillsbury: *Attention* (p. 11)]. It fails, however, to emphasize the conative aspect of attention, which is the essence of the process according to the best educational thought and practice. When a boy is attending properly, it is not enough that he should clearly comprehend the master's words; the important thing is that his own mental activity should be stimulated and controlled. For a master who knows how to teach, "attention is a mode of mental activity by which a given system of mental processes is intensified, directed, and sustained to the exclusion of all incompatible and irrelevant mental processes" [Burt: In "Report of a Conference of London County Council Teachers, 1913," p. 25].

Conative and Affective Elements. The conative theory of attention may be regarded as one outcome of a movement which is modifying both our educational ideals and the practice of the schools. In education, as generally in our social life, the individualistic and narrowly intellectual point of view is being superseded by one which endeavours to do fuller justice to the social, emotional, and conative aspects of experience. The theory will doubtless undergo further changes as our knowledge of mental life increases; but, in its present form, it owes much to the results obtained by psychological experiment and is supported by the authority of the best contemporary English psychologists. Thus attention is defined as "the mind at work or beginning to work upon its object"; or, as essentially consisting "in a felt tendency to dwell on an object so as in some way to adjust ourselves to it theoretically or practically." [See;

Stout & Baldwin in *Dictionary of Philosophy and Psychology* sub voce; and Stout: *Manual of Psychology*, 1913 (p. 135).] "Effort of attention," says Dr. McDougall, following William James, "is the essential form of all volition": a statement which emphasizes the conative aspect of attention from a somewhat different point of view. [See *Social Psychology*, 1914 (p. 242); comp. James: *Principles of Psychology*, Vol. II (p. 562).] This theory of attention brings into prominence the affective element in the attention process. If our minds are at work on an object, we are sensible that the object concerns us; we have a feeling towards it or an interest in it. This interest involves cognition and conation; but its core is an emotional attitude towards the object, which may include pleasure, or pain, or any emotion. The continuity of our interest in the object maintains, and is itself maintained by, the continuity of our attention; while the whole process of attention is directed towards the satisfaction of our interest. Interest and the conative process of attention mutually imply each other. We may say that a boy attends when he is interested, or that he is interested when he attends. As has already been suggested, the practice of good teachers implies a view of interest and attention similar to the one just outlined. Thus, to give a single example only, we find such teachers usually begin a lesson by assuring themselves that the class realizes the importance of the end to be attained. By so doing, they tend to secure that continuity of interest which should characterize a lesson as a sustained process of attention. Just as the intellectualist doctrine of attention led teachers to regard Herbart's *First Step of Preparation* as the most effective beginning for a typical lesson, so the provision of an adequate aim, appreciated by the boys themselves, is the first step demanded by the conative doctrine.

How to Secure Attention. This view of the meaning of attention throws light upon the practically important problem of how attention is to be secured. If it is accepted, the chief conditions of attention may be grouped under three heads. First, we have the so-called objective conditions of attention. Certain types of stimuli normally tend to excite attention. Thus a stimulus tends to challenge attention if it is intense, extensive, changing, sudden, novel, or repeated. A large picture is more effective than a small one. An unexpected change of procedure will often pull a class together, while a sudden interruption is distracting. A moving object will nearly always hold the attention of the class. Secondly, the direction of attention may be determined by associations formed in the course of the boy's previous experience. A present situation recalls similar situations in the past, which included features not forming part of the existing situation. These additional features, when recalled by association, may become the object of attention or influence its course. In this way, previously formed associations may render attention more effective, as when the subject of a lesson recalls situations in the boys' daily lives; but, when attention is not controlled by a strong coherent interest, the recalled associations may lead it to pass more or less aimlessly from one object to another, as is shown by the conversation of garrulous and weak-minded persons. But, thirdly, the most important conditions determining attention are those due to the dispositional interests

developed during the boy's previous life. By the action of his experience on his congenital endowment, he will have acquired a relatively permanent tendency to feel an interest in certain objects or groups of objects. In the presence of an appropriate stimulus, the dispositional interest becomes active, involving a corresponding act of attention. The boy's interest in football will make him hear the clock strike the hour at which he is free to play, while under other conditions the sound might have passed unnoticed.

These dispositional interests largely determine the course of the boy's mental life and, being relatively permanent, manifest themselves in specific habits of attention. As such an interest grows more comprehensive and coherent, the corresponding acts of attention become more systematic, less liable to distraction by irrelevant stimuli, but more responsive to any stimulus connected with the interest. Thus, for example, the development of the child's interest in picking flowers into the botanist's devotion to his science implies the evolution of a complex system of habits of attention. In particular, a strong dispositional interest in some worthy end will help a boy to keep his attention fixed even on a distasteful object, and so tend to save him from belonging to the class of frivolous persons whose attention is at the mercy of any momentarily attractive stimulus. It follows that, while use will be made of suitable objective stimuli, or pre-formed associations, the chief method by which the school will arouse and guide the attention of its pupils will be by fostering the growth of healthy dispositional interests.

Probably the main weakness of the traditional methods of teaching has been their failure to do this to the fullest possible extent. Schoolwork has been kept too much apart from other fields of vivid personal experience.

These conditions of attention are exemplified in the social influences of the boy's school life. The words and gestures of his masters and companions are among the most potent stimuli which challenge his attention. The traditions of the school society and the exciting incidents of school life give rise to a multitude of strong associations. His participation in the common life widens his aims and provides opportunities for their pursuit, and thus leads to the growth of dispositional interests of great value.

Stimuli and Interests. Individuals differ in their ability to attend to various classes of stimuli, and in the general character of their attention. Thus, one boy's attention will be easily aroused by a fresh stimulus of almost any kind, while another boy will find it difficult to attend to unfamiliar presentations. [See e.g., Rusk: *Experimental Education* (p. 41).] The further investigation of these differences is likely to throw light upon the methods of education appropriate for children requiring individual treatment. Valuable results may also be expected from a systematic inquiry into the changes which the child's attention undergoes with advancing years. [On these changes, see Meumann: *Vorlesungen über experimentelle Pädagogik* (Vol. I, p. 139); Rusk (p. 46).]

But the kind of attention paid to an object depends also, in part, upon the character of the interest involved. If our interest is in the object for its own sake, so that our adjustment to, or mastery of, the object is an end in itself, our attention is immediate. If, however, we are interested in the object as a means to a further end, our attention

is derivative. A boy may read a book with attention either because he is interested in what he reads, or for the sake of passing an examination. Moreover, the nature of our attention varies according to the kind of stimulus by which it is aroused. We may be said to have different attentions for different senses. These variations in the process of attention have led some writers to speak of attentions in the plural rather than of attention in the singular, or even to prophesy that the term attention will disappear altogether from scientific psychology and education. [See Rusk (p. 38); compare Baldwin: *Mental Development in the Child and the Race* (p. 313); Pear, in the "Report of a Conference of London County Council Teachers, 1913" (p. 30); Watt: *Economy and Training of Memory* (p. 38).] Whether this will be so, the future must decide. At present, it seems convenient to employ the term to denote "the essential form of all mental activity" [Stout: *Manual of Psychology* (p. 126)], remembering that it covers a wide variety of mental processes. H. BOMPAS SMITH.

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ATTITUDE OF MIND OF TEACHER towards pupil.—The teacher must understand how his pupils think, and must plan his teaching so as to stimulate logical trains of thought. He must, therefore, know the mental possibilities of his pupils and the laws governing the influence of mind upon mind.

ATTITUDES.—(See PERSPECTIVES, APPRECIATIONS, AND ATTITUDES.)

AUCKLAND UNIVERSITY COLLEGE.—(See NEW ZEALAND, EDUCATION IN.)

AUDIOMETER.—An instrument for testing the sense of hearing and registering its degree of power. A telephone receiver conveys to the ear the sound of clicks caused by an electric current, which can be varied so as to produce sounds varying by very small differences. By testing a large number of persons, an average or normal power can be determined.

AUDITORY DISCRIMINATION.—The power of distinguishing qualities and intensities of sounds. (See AUDIOMETER.) The degree to which this power is possessed by an individual depends upon his ability to distinguish musical sounds. The power varies greatly from that of the good "musical ear," which will distinguish minute differences in the number of vibrations of a tuning fork, to that of the "tone deaf," to whom all musical sounds are alike. Weakness of this power renders an individual practically incapable of learning or appreciating music.

AUFKLÄRUNG, THE.—(See ENLIGHTENMENT, THE.)

AUGUSTINE, ST.—Was sent to Britain by Pope Gregory in A.D. 596, landed in 597, and became the

first Archbishop of Canterbury. Bede's *Ecclesiastical History* gives an interesting account of the landing of Augustine and his companions in the Isle of Thanet and of their reception at Canterbury. The Pope sent the pall to the archbishop in 601. In 604, Augustine consecrated Mellitus and Justus as bishops of London and Rochester respectively. Augustine's first church was an old Roman building formerly used for Christian worship, and this was repaired for his cathedral. He founded a house of monks, called the Abbey of St. Peter and St. Paul, which, after his death, was re-named the Abbey of St. Augustine, and in recent years has been used as a missionary college. Augustine endeavoured to unite the British Church in Wales with his own; and for that purpose a conference was held at Anst, on the Severn, in Gloucestershire, but no agreement could be reached.

AUGUSTINE OF HIPPO (A.D. 353-430).—He was the son of a public official in Numidia and a Christian lady named Monica. Being clever and intelligent, he was sent to Carthage to be educated, and there he joined the sect of Manichaeans, becoming a lecturer on literature and rhetoric. In Milan, having met St. Ambrose, the bishop, he became a Christian, and was baptised by Ambrose in 387. He now wrote treatises against the Manichaeans and other heretical sects, and became one of the greatest of the Fathers and defenders of the early Christian Church. He returned to Numidia in 391 as a priest, and lived at Hippo until 430, when the city was besieged by the Vandals, and he perished.

Augustine wrote his autobiography under the title of *Confessions* (397); *De Civitate Dei* (412-426), a vindication of the Christian Church rising on the ruins of the Roman Empire; *Retractions* (428), a confession of errors in his writings. Augustine's faith included much of what was known later as Calvinism, and his views of Christianity and religious life went far in guiding the Church through many centuries. During the controversies in the Reformation period, Augustine's writings were quoted as authoritative by both great parties.

AUGUSTINIANS AND EDUCATION.—(See MENDICANT ORDERS, DURING THE MIDDLE AGES, EDUCATION IN.)

AURELIUS.—Marcus Aurelius, as he is now called, was Roman Emperor from A.D. 161 to A.D. 180. Most of his reign was occupied by wars against the northern barbarians and by rebellions in the east. He was an opponent of the Christians, whom he regarded as dangerous and superstitious fanatics. Polycarp and Irenaeus were victims of his persecutions. As a philosopher, Aurelius was one of the most eminent of the Stoics. His *Meditations* are an exposition of his philosophy and his sad thoughts on the experience of life. Written during times of war and tumult, they are the revelation of the soul of a great philosopher who loved peace—"a revelation of a personality without parallel in Greek or Roman literature" (Rendall).

AUSTRALASIA, THE UNIVERSITIES OF.—Australia and New Zealand have been very far-seeing in their outlook upon educational matters; and, both by private benefactions and State grants, have made generous provision for university education.

To-day, every one of the six States which compose the Commonwealth of Australia has its own university: even little Tasmania, with its population of about 200,000, having a small but efficient and self-contained university granting its own degrees, which are recognized by the other States of the Commonwealth. When we consider that the total population at the last Census was not quite 5,000,000, this provision, in a new and but partially developed country, is extremely creditable.

The oldest university is that of the mother State, New South Wales, which was inaugurated by charter in 1850, and began in 1852 with only twenty-four matriculated students. It now has nearly 2,000 students, 32 professors, and 102 lecturers and demonstrators. The University of Melbourne, the friendly rival of New South Wales, followed rapidly in 1853; and is to-day a flourishing institution, nearly as large as that of New South Wales, but not quite so generously endowed by private benefactors. South Australia and Tasmania established their universities in 1874 and 1889; while Queensland and Western Australia, more recently settled States, have lately established their universities in 1911 and 1913 respectively.

Though having distinct individualities of their own in each of the six States, yet the Australian universities present certain points in common which are of interest. Perhaps that which strikes the visitor most is their democratic spirit. Australia has not, as yet, a large leisured or cultured class; and the type of student still seen at Oxford and Cambridge who enters the university with no distinct idea of qualifying for a profession, but as a finish to his general education, is almost non-existent. Students come in large numbers from the industrial and middle classes, because they wish to get special training—medical, legal, pedagogic, and so forth—and, as a rule, they are very steady workers. There is such generous provision for scholarships, that the son and daughter of the artisan can, and do, qualify for the highest professions in a way as yet impossible in England.

Special Features. Women are admitted to all the universities on an equal footing with men. Sydney and Melbourne opened their doors to women as far back as 1881, thus following rapidly the example of London, which, in 1878, was the first university in the United Kingdom to give women the same status as men. There are large numbers of women students, particularly in the Arts departments, and they are well represented in medicine and dentistry. Most of the universities have colleges and hostels for women, which are greatly appreciated. Many of the students come from long distances, and would otherwise be reduced to living in lodgings in a strange city without the advantage of the corporate life of the University.

The University Extension Movement has been introduced, and lecturers are sent out to many of the far-distant country towns which are enterprising enough to organize courses of lectures during the winter months. Lantern lectures on historical and literary subjects are very popular, and the lecturers report that a most intelligent interest is manifested by the audiences. In Queensland, correspondence courses are organized to follow the actual work of the university classes, for the benefit of teachers and others in far distant parts of the State, and one lecturer is specially set apart to attend to this branch of the work, which is more or less experimental at present. When it is

remembered that Queensland is as large as France, with a scattered population of less than three-quarters of a million, it will be easy to understand the value of such courses as these to the many school teachers working in the lonely parts of the bush. A Workers' Educational Association has recently been formed in Sydney, Melbourne, and Brisbane; and tutorial classes in economics and kindred subjects have been started. The movement is extending to the other States, and is connected, in each State, with the university. In close connection with all the universities are training colleges for teachers. In Sydney and Melbourne these colleges are housed in fine buildings within the university campus, and many of the students attend the ordinary university lectures for their general education, while they receive specific pedagogic instruction in the training colleges. Diplomas of Education, depending upon excellent courses of instruction in methodology and psychology, are also issued by the universities, and are highly prized by secondary as well as the more capable among the elementary teachers.

Compared with the fees of older British universities, those of Australia are very low; in Western Australia university education is free, and in Queensland there are comparatively few paying students. Residence in one of the colleges is rather more expensive than in those of our provincial universities, but scholarship students are often given a generous maintenance grant in addition. There is diversity of opinion as to the wisdom of providing free university education, but it is the wish of most of the Governments that "the educational ladder" should be within reach of all who have the ability to climb it.

Staff and Students. In former days, the professors and lecturers were mainly appointed from home; but as there are now a large number of well-qualified Australian-born candidates from whom to select, it is becoming more and more usual to appoint Australians, preference generally being given to those who have studied abroad as well as in an Australian university. This was specially noticeable in the selection of the staff of the youngest university, that at Perth; and the appointments have given widespread satisfaction.

Australian students are very frank and outspoken. They are independent in outlook, resourceful, and capable. Men and women mingle freely in the classes, as they have done previously in the State schools. The general attitude towards the staff is friendly, though somewhat critical, for the young Australian is no respecter of persons, and forms his own impressions. The various "unions" and "societies" do much to bridge the gaps between staff and students, and between students of the different faculties; and life in an Australian university is, on the whole, very wholesome, hearty, and healthy.

The tendency is naturally for students to be attracted towards the more utilitarian courses of study; and one finds the medical, veterinary, engineering, and agricultural faculties largely selected by the men students, while there are more women in the arts and educational classes. The universities maintain a good standard, and the degrees and diplomas are valuable evidences of thoroughly sound work done by their recipients, extending over periods varying from three to five years.

The Universities of New Zealand. Much of what

has been said of Australian university life and conditions applies to New Zealand. There are, however, two fundamental differences in the constitution and development of university education. New Zealand has not the same proportion of resident students, as the hostel system is by no means common; and there is, at present, but one university for both Islands, designated "The University of New Zealand." To this are affiliated four university colleges, situated at Otago, Canterbury, Auckland, and Wellington. The University of New Zealand, alone, has power to confer degrees, with the express stipulation that it is an examining but not a teaching body, undergraduates for the most part keeping their terms at one or other of the affiliated colleges. It is possible, also, for a student to sit for the examinations and obtain a degree without having attended a university college. The University of New Zealand is thus modelled on the lines of the University of London in its older form, before the conferring of internal degrees. Since its foundation in 1870, nearly 2,000 degrees have been conferred.

There is a training college for teachers affiliated to each of the university colleges, with a total enrolment of 500 students. These attend the latter colleges for their general education, receiving their technical instruction in the training colleges and attached practising schools, as in Australia.

University scholarships and bursaries are on a very generous scale, so that, to quote from the recent *Year Book of New Zealand*, "there can be few indeed entitled to special consideration who are deterred from a university course by the question of the cost of classes." The colleges are excellently staffed with professors and lecturers of very high standing, and the level of work required to be reached by candidates for final degrees is excellent, and, indeed, compares favourably with that of similar institutions in the United Kingdom.

At present, a considerable number of the examiners in the various faculties are resident in the United Kingdom, so that there is a rather trying delay, from the point of view of the students, in announcing the results; but the work is done as expeditiously as possible and the organization of the examinations is excellent.

Education in New Zealand ranks deservedly high, and is generally appreciated, the proportion of young people who proceed to a university course being very good, especially when one realizes that the population is to-day not much over 1,000,000 and that the country is still largely undeveloped.

M. A. W.

AUSTRALASIAN EDUCATIONAL STATISTICS.

—The following statistics will serve to indicate the pre-war position and tendencies of education in Australasia. As far as they relate to the Commonwealth, they are taken for the most part from its *Year Book*. Owing, however, to the variations that exist both in the educational systems of the different States and in their methods of preparing returns the figures are not always strictly comparable, and it would require a greater variety of tables than space will allow to present an accurate view over the whole field. An endeavour has been made to include sufficient to show the pre-war stage of development of each branch in each State, and the relative importance attached thereto as far as may be judged by the money the State is prepared to devote to its support.

STATISTICS.

PERCENTAGES OF EDUCATED AND ILLITERATE PERSONS FROM CENSUS RETURNS.

	Aust. (1881).	N.Z. (1886).	Aust. (1891).	N.Z. (1896).	Aust. (1901).	N.Z. (1906).	Aust. (1911).	N.Z. (1911).
Read and Write	71	74	(?) 76	81	80	83.5	84.5	84
Read only	6	5	3	3	2	1.5	.5	.8
Cannot read	23	21	21	16	18	15	15	15.2

STATE SCHOOLS, TEACHERS, AND SCHOLARS, 1913.

State or Territory.	Popula- tion.	Schools.	Teachers.	Average Attend- ance.	Percent- age of Average Attend- ance to net en- rolment (Primary Schools).
New South Wales	1,834,000	3,285	6,627	178,028	80
Victoria	1,412,000	2,218	5,734	157,140	74
Queensland	660,000	1,338	3,246	79,955	76
South Australia	440,000	815	1,627	43,319	74
Western Australia	321,000	556	1,303	36,264	87
Tasmania	202,000	431	897	21,174	78
Northern Territory	4,000	4	6	68	—
New Zealand (including Secondary Depart- ments of District High Schools)	1,135,000	2,255	4,878	151,242	90

STATE SCHOOLS: TEACHING STAFFS, 1913.

State.	Principal Teachers.		Assistants.		Pupil or Junior Teachers.		Sew- ing Mis- tresses	TOTAL.		
	Males	Fem.	Males	Fem.	Males	Fem.		Males	Fem.	Total.
New South Wales	2,119	450	1,362	2,518	9	169	105	3,490	3,242	6,732
Victoria	1,572	756	450	1,316	349	1,291	441	2,371	3,804	6,175
Queensland	780	559	337	817	320	433	—	1,437	1,809	3,246
South Australia	372	431	90	472	59	203	136	521	1,242	1,763
Western Australia	318	235	123	497	11	119	59	452	910	1,362
Tasmania	179	245	59	210	35	169	2	273	626	899
Northern Territory	2	4	—	—	—	—	—	2	4	6
New Zealand	1,253	916	350	1,743	142	474	—	1,745	3,133	4,878

STATE EXPENDITURE ON EDUCATION, 1913.

(In £1,000.)

	N.S.W.	Vict.	Qld.	S. Aust.	W. Aust.	Tas.	N.Z.
Maintenance	1,318	976	433	243	258	91.5	1,360
Cost of Maintenance per head of Pop.	14/5	13/10	13/1	11/-	16/1	9/1	23/11
Buildings	347	158	78	59	72	16	124
Total Cost	1,665.5	1,134	510.5	302.5	330	108	1,484
Cost per head of Population	18/2	16/1	15/6	13/9	20/7	10/8	26/2

PRIVATE SCHOOLS, 1913.

State.	Schools.	Teachers.	Enrolment.	Average Attendance.
New South Wales	733	3,593	64,591	54,305
Victoria	519	1,846	49,549	40,000
Queensland	153	795	18,092	15,518
South Australia	164	638	12,362	9,281
Western Australia	119	459	10,335	9,101
Tasmania	88	320	6,275	4,434
New Zealand	304	1,016	21,115	18,941

UNIVERSITIES, 1913.

	Pro-fessors.	Lecturers, Assis-tants and Den.on-strators.	Students.		Total.	Income.
			Matricu-lated.	Non-Matricu-lated.		
Sydney	32	102	1,167	478	1,645	£ 90,956
Melbourne	18	64	—	—	1,256	76,811
Adelaide	11	38	415	305	720	28,940
Tasmania (Hobart)	5	9	92	70	162	8,636
Queensland (Brisbane)	4	19	198	9	207	18,400
Western Australia (Perth)	8	4	118	64	182	14,821
New Zealand (1914)—						
Auckland	8	16	425	185	610	14,546
Wellington	10	17	325	52	377	12,272
Canterbury	10	12	330	208	538	18,815
Otago	18	25	489	120	609	29,605

TECHNICAL EDUCATION, 1913.

	N.S.W.	Vict.	Qld.	S. Aust.	W. Aust.	Tas.	N.Z.
No. of Classes	582	92 ¹	353	218	237	76	1,626
Enrolment	16,193	9,036	7,958	4,885	5,702	1,013	15,206

¹ Subjects.

J. H. H.

AUSTRALIA, TEACHERS IN.—The States in Australia, while steadily progressing with the development of systems of education fitting their respective circumstances, have certain common features of great interest. Each State is fully alive to the fact that education is a necessity; there is a healthy rivalry between them, and, indeed, one can find, in the official publications of the various Ministries of Education, comparisons with other parts of the Empire and with other countries. For example, the State of Victoria awards travelling scholarships, particulars of which are to be found in the *Victorian Year Book*—

“On the recommendation of a Board consisting of the Director, the Public Service Commissioner, and a member of the teaching staff of the University, one travelling scholarship, tenable for one year, for the purpose of enabling the holder to pursue such studies and investigations outside Victoria as may be approved by the Minister, will be awarded annually to the following classes of officers: (a) An

inspector of schools; (b) a lecturer in the Teachers' College, or a teacher in a technical school; (c) a teacher in a higher elementary school, or in a district high school; (d) a teacher in an elementary school.

The value of the scholarships is full pay during the absence of the holder from Victoria; and, if the salary does not exceed £250 per annum, an additional allowance up to £50.

“On the recommendation of the Board mentioned above, the following travelling scholarships are also to be awarded—

“To an officer of the Education Department annually, for the purpose of allowing him to undertake such studies as may be approved by the Minister. The value of this scholarship is £150 per annum, together with an allowance, and it will be tenable for one or two years as may be determined.

“To teachers of modern languages in the service of the Department who are also graduates in arts and in education, and who have obtained final

honours in the School of Modern Languages at the Melbourne University. This scholarship, which is given biennially, is valued at £150, and is tenable in France and in Germany for courses approved by the Minister.

"To exit-students or to teachers in technical schools annually to enable the holders to undertake such duties as may be approved by the Minister. This scholarship is tenable for one year, and entitles the holder to an allowance of £150 with an allowance for travelling expenses.

"For all travelling scholarships, except the last mentioned, the holder is required to enter into an agreement by himself and an approved surety not to relinquish his scholarship, and for three years after its termination to remain in the service of the Department."

The State of Victoria has perhaps made more systematic arrangements than other States in this particular, but awareness of what is going on elsewhere is very marked in Australia. Of course, when it is realized that the expenditures of the several States on education are comparable with those of our larger provincial cities in England, it will be seen that the travelling scholarships are chiefly remarkable for the amount of money and the length of leave allowed to the holders.

Staffing. In general, it may be said that the States are all willing to establish a school where a minimum average attendance of ten can be guaranteed. There is a certain difficulty in staffing the smallest schools, because a young unmarried woman cannot be sent to live alone in a remote school house; and if men can be found to take charge of the schools, that is an expensive solution of the difficulty. Here, from the administrative point of view, is the advantage of having the teachers as members of the Civil Service; they can be transferred from school to school as required, so that a teacher need not think that, because he has once accepted a post in a small school, he is definitely fixed for life.

Every facility is afforded for teachers to improve their qualifications. Not only do the various departments issue documents for the guidance of teachers in dealing with the various subjects of the curriculum, and arrange conferences of teachers and inspectors, conferences equivalent to the classes arranged in England for uncertificated teachers, but at least two of the States arrange correspondence courses of tuition for teachers to enable them to prepare for their examinations.

The Australian States can claim to have the best specimens in the Empire of the *itinerant teacher*. His duties are to travel over a certain district, find every child of school age; and, besides giving such lessons as, during his short stay he can contrive to arrange, to act as the librarian of a circulating library, so that the child and his parents may find the teacher's visits welcome. An average round for an itinerant teacher in Queensland is about 2,000 miles. The salary in Queensland is from £130 to £150, with an allowance, varying from £10 to £35, to meet the increased cost of living. Travelling expenses are all paid, and the sum of 12s. per week is granted for the pay of a "boy" who acts as groom and does odd jobs.

The Influence of Central Control. In the Australian education service, the various grades of qualification of teachers are carefully determined by the one central authority. Salaries are also determined by it, and in every State special allowances are made

to meet special circumstances in the cost of living. What is perhaps even more important is that promotion is determined also by the central authority. That is to say, a position on falling vacant is not advertised; applications are not invited and, if made, are not considered. The Regulations specify certain qualifications which must be possessed by any person appointed to a particular post; these qualifications include not only the passing of examinations, but the earning of a "skill mark." In Tasmania, where this system is most consistently enforced, the "skill mark" is awarded by the director after considering the inspector's report on the teacher in respect of adaptability, zeal, disciplinary powers, effectiveness (as shown by results at inspection, and by success in preparing scholars for departmental examinations), diligence, and tact in dealing with children and with parents.

The Regulations provide that the Minister may, when there are special circumstances, appoint a person who does not satisfy the conditions laid down. It is also provided that any teacher who considers that his claims for promotion have been overlooked may appeal to the Minister.

The large majority of teachers in Australia are employed in schools having upwards of a hundred scholars. In the villages and towns of Australia, there are employed teachers of all the types familiar in England; viz., head teachers, class teachers, teachers in training, and specialist teachers. Salaries of head teachers range from about £100 to about £450 or £500, in the case of men; head mistresses receive from about £100 to £300; class teachers receive salaries of £100 to £375, if certificated, according to their length of service and the size of the school in which they are engaged.

Superannuation schemes are in operation. They vary in the different States; in some States subscription is optional, in others compulsory. The retiring age also varies, being 60 years for men in one State and 70 in another. On the whole, Australia may justly claim to have, as a Commonwealth, at least as much system as the United Kingdom. If she has not the advantages of the traditions which influence education in the Mother Country, she certainly avoids some of the disadvantages. Not less than the Mother Country does she value education, and in meeting her own special needs she endeavours to secure that each member of the teaching profession shall worthily represent the type of teacher to which he (she) belongs.

A. C. C.

AUSTRALIA.—(See NEW SOUTH WALES, QUEENSLAND, SOUTH AUSTRALIA, VICTORIA, AND WESTERN AUSTRALIA.)

AUSTRIA, THE EDUCATIONAL SYSTEM OF.—This article is written to provide an idea of the position of education in Austria up to 1914. The War disorganized the whole country and affected adversely the progress of education. Among the great losses sustained by Austria, during the War and under the terms of the Peace Treaty, not least among them must be considered that of the universities of Prague and Czernowitz, the Czech university of Prague, and the Polish universities of Lemberg and Cracow. No attempt has been made to give the position of education in Austria as at present constituted, for, owing to the great political changes brought about by the Peace Treaty and the necessary reconstruction of the



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Air Photo of University College, Bangor

country, no figures that can be relied on are available. The following facts, however, may be of use as likely to provide a basis of the future educational system of the new Austrian Republic.

In 1914, education in Austria ranked high in comparison with that of the surrounding nations and, but for the constant internal friction caused by the clashing interests of the subject nationalities, it might have ranked higher still. A vast amount of learning was acquired in the universities and colleges, but, unlike the sister institutions of Hungary, those of Austria paid little regard to physical training. *Mens sana in corpore sano* is an axiom not considered of importance in Austrian scholastic circles, the rule apparently being to develop the mind and leave the body to take care of itself.

Public instruction was provided for by four categories of educational institutions: high schools, middle schools, technical schools, and elementary schools—all, since 1869, being free from ecclesiastical control.

Higher Education. The high schools comprised the eight universities: Vienna, Graz, Innsbruck, Prague, and Czernowitz (in each of which German is the medium of instruction), the Czech university at Prague, and the Polish universities of Lemberg and Cracow. Each of these has four faculties: Theology, law and political economy, medicine, and philosophy—that of Czernowitz excepted, which lacks the faculty of medicine. The theological faculties are Roman Catholic, with the exception of that of Czernowitz, which is Greek-Oriental.

Table A gives a summary of figures for the whole eight universities for the winter semesters of the years indicated. Comparison with Table B will show the progress made up to the time of the outbreak of the Great European War, which resulted, for Austria, in the loss of much territory and therefore, of five of her Universities, and many large educational institutions.

In University Extension work, Austria, taking England for her model, founded, in 1885, the Society for Popular Education (*Volksbildungverein*). The movement, being entirely unpolitical and unsectarian, had the fortune to be frowned upon by the powerful Christian Socialists (a strictly Catholic body), who, having captured the Municipal Council of Vienna, immediately withdrew the subvention that the Society had hitherto received from the civic treasury, as well as certain privileges it had enjoyed. This action, however, defeated its own end by arousing popular enthusiasm for the cause. The donations of rich and poor alike flowed in from all sides, soon placing the institution in a position of independence of the local authorities. The practical zeal of its beneficiaries—mostly of the clerk and skilled artisan classes—led to the founding of two working men's colleges (*Volksbildungshäuser*) in Vienna, in which lectures are given as at the university. Of the students, nearly half are women, who generally attend the courses on languages, history, and art in preference to those on the sciences. Both these establishments have laboratories even better equipped than those of the university. The students hear lectures on political and natural science, philosophy, English literature, art, history, music, and photography. An annual holiday tour was inaugurated, which, bringing lecturers and students into more intimate relations with each other, proved so eminently successful, that even the university thought it worth while to imitate—proving its gratitude to

the originators of the scheme by sending its most famous scientists and men of letters to assist in the good work of the *Volksbildungshäuser*.

There were seven technical high schools: in Vienna, Graz, Prague, Brünn (in each of which German is the medium of instruction), Prague (Czech), Brünn (Czech—founded in 1899), and Lemberg (Polish). All these institutions have special departments, building, engineering, machine construction, chemistry, and general. At Brünn, there is no building department, and at Lemberg no general department.

Vienna has a high school for agriculture, with sections for husbandry, forestry, and technical cultivation.

Attendance at these institutions during the winter semesters of the years indicated is shown on Table C.

In addition to the high schools enumerated above, must be mentioned the College of Veterinary Surgery at Vienna; the mining academies of Leoben and Příbram; the schools of art at Vienna, Prague, and Cracow; the Catholic theological seminaries at Salzburg and Olmütz; and the Protestant Theological College at Vienna. Altogether there were forty-five theological educational institutions in the Austrian Empire (excluding Hungary), among them being one Greek-Catholic, one Greek-Oriental, and one Armenian.

Secondary Education. The middle schools consist of the gymnasia, real-gymnasia, and real-schools—the gymnasia (equivalent to the English grammar schools) for classical culture and the others for general instruction. Their growth is shown in Table D.

Up to the commencement of the Great War, a strong movement existed in favour of educational reform by the substitution, in the higher and middle establishments, of modern languages for Latin and Greek. As was but natural, however, the movement found vigorous opponents in those teachers of the classical tongues and history, whose occupation was in jeopardy from the proposed innovation. A spirited controversy—interesting to the impartial onlooker—ensued, there being doughty champions in both camps.

Training of Teachers. Of the 83 teachers' training colleges, 50 were for males and 33 for females. A four-years' course of study is necessary to qualify for the certificate of teacher. The gentler sex, however, receive but little official encouragement to take up the teaching profession, though they may qualify in letters, science, and medicine. Law has been a subject of study forbidden to women.

Special Schools. In 1914 there were 187 communal and 940 industrial schools. Among the latter, 21 were national in character, 158 technical (devoted to particular industries), and 761 adult schools. In addition to these, there were 137 schools of agriculture and forestry, 6 for mining, 3 naval, 8 veterinary, 15 for midwifery, 509 for music and the drama, 612 for needlework, lacemaking, and dress-making; and 802 other schools for various kinds of special training, among them being the well-known School of Arts and Crafts (*Kunstgewerbeschule*) of Vienna, which is attended by many pupils from the neighbouring countries.

Elementary Education. In the smaller provincial towns and villages, elementary instruction is given in the national schools (*Volksschulen*), and in the larger towns in the municipal schools (*Bürgerschulen*).

By the provisions of the Education Act of 1869, every commune in which there are forty children

THE AUSTRIAN UNIVERSITIES—

TABLE A.

Year.	Teaching Staff.	Ordinary Professors (included in Teaching Staff).	Lectures delivered.	Students attending.	Decennial Percentage of Increase.
1875 . . .	689	273	1,091	9,227	—
1885 . . .	1,029	334	1,541	13,069	41·64
1895 . . .	1,262	424	1,925	16,560	26·71

THE AUSTRIAN UNIVERSITIES—

TABLE B.

Year.	Teaching Staff	Ordinary Professors (included in Teaching Staff).	Lectures delivered.	Students attending.	Decennial Percentage of Increase
1905 . . .	1,517	529	2,332	20,275	20·81
1914 . . .	1,777	646	2,747	24,064	18·61 ¹

¹. For nine years.

THE TECHNICAL HIGH SCHOOLS OF AUSTRIA—

TABLE C.

Year.	Teaching Staff.	Ordinary Professors (included in Teaching Staff).	Lectures delivered.	Students attending	Decennial Percentage of Increase.
1875 . . .	287	102	441	1,570	—
1885 . . .	372	120	846	2,566	60·25
1895 . . .	416	130	678	3,140	22·65
1905 . . .	482	141	709	6,117	94·80
1914 . . .	553	156	745	9,285	51·79 ¹

For nine years.

AUSTRIA—

TABLE D.

Year.	GYMNASIA AND REAL-GYMNASIA.			REAL SCHOOLS.		
	Number.	Teachers.	Pupils.	Number.	Teachers.	Pupils.
1875 . . .	155	2,527	34,137	74	1,302	21,552
1885 . . .	172	3,512	54,288	80	1,353	16,969
1895 . . .	181	3,756	56,152	80	1,610	23,601
1905 . . .	199	4,607	68,075	110	1,895	29,213
1914 . . .	217	5,762	77,342	144	2,087	34,641

AUSTRIA—

TABLE E.

Year.	PUBLIC ELEMENTARY SCHOOLS.			PRIVATE ELEMENTARY SCHOOLS. ¹			
	Number.	Teachers.	Pupils.	Number.	Teachers.	Pupils.	
1875 . . .	14,257	27,677	2,050,808	909	16,362	264,519	¹ The returns furnished by the private schools are not reliable.
1885 . . .	16,440	54,467	2,679,638	976	17,568	284,016	
1895 . . .	18,258	69,776	3,260,852	987	17,766	287,217	
1905 . . .	19,342	78,993	3,975,556	989	17,811	294,976	
1914 . . .	21,121	89,679	4,781,224	998	17,997	299,955	

over 6 years of age is bound to provide a public elementary school, and, with few exceptions, school attendance is obligatory from the sixth to the fourteenth year. Private schools also are permitted, which, if fulfilling the requirements of the Act, are accorded the status of public schools.

Table E shows the progress of the *Volks-* and *Bürgerschulen* up to 1914.

In 1908, of the public elementary schools, 42 per cent. had one class only, 25 per cent. two classes, 11 per cent. three classes, 7 per cent. four classes, 11 per cent. five classes, and 4 per cent. six to eight classes. In 40 per cent. German was the medium of instruction, in 26 per cent. Czech, in 11 per cent. Polish, in 10 per cent. Ruthenian, in 40 per cent. Italian, in 4 per cent. Slovak, in 2 per cent. Serbian, and in 3 per cent. Rumanian.

The latest available statistics show an average of 77 elementary schools per 100,000 of the population; 78 pupils to each school, and 50 pupils to each teacher. Of the children under obligation to attend school, 88 per cent. actually attended.

This brief sketch of the educational conditions of Austria would hardly be complete without a reference to the Toynbee Halls of Vienna. Supported mainly by the Jews, in the interests of the poor of their own race and faith, these useful institutions provided free lectures on subjects of practical importance, accompanied by light refreshments—also gratis.

Among so much excellence, it is a sad reflection that in the mountainous and outlying districts—off the beaten track—some 70 per cent. of the inhabitants are still illiterate. A. L. D.

AUTHORITY AND OBEDIENCE.—A school or class is an organized society of a special type, and the authority by which school discipline is maintained is identical in character with the authority which controls and guides the corporate life of other social groups. This authority owes its existence to the consciousness shared by the members of any society that certain common interests must take precedence of the members' personal desires; and that there must, therefore, be some authority by which the common life of the society is ordered so that each member may play his part in the achievement of the common interests. Thus authority has the right to demand obedience, because its exercise is necessary for the realization of the common aims of those from whom obedience is exacted. By its very nature, authority must not be dependent upon the chance desires of individual persons. It

must be able to compel the obedience of those who would otherwise prefer their individual aims to the interests of the society as a whole. In an ideal society, such obedience would be rendered without the necessity for any appeal to force, and authority would be a moral instrument for the promotion of moral aims. In less perfect societies, forcible means may be needed to secure obedience. But in any case, those who obey must implicitly acknowledge that they are members of the society by which the authority is exerted, and that the authority has, therefore, a claim upon themselves. Otherwise they may yield to forcible compulsion, but do not render obedience as rational human beings. A householder may submit to, but cannot obey, a burglar.

Application of Principles to Education. The application of these principles to the particular conditions of school life provides us with an intelligible theory of school discipline, and throws light upon the changes which are taking place in the methods by which discipline is maintained. The fundamental principle that the basis of authority and of correlative obedience is the corporate mind or will of the whole society has, indeed, been obscured in educational, as in political, theory by the sharp division drawn between the ruler and the ruled. This division, however, has always broken down in practice. No sovereign and no master can afford to disregard the point of view and interests of those from whom he exacts obedience. The master's authority will secure obedience in proportion as the boys feel that the exercise of this authority is necessary for the work and order of the class. If a master could enforce his own individual will without any regard for the system of the school or for any recognized ethical principles, he might compel his boys to do certain things, but he would not obtain obedience in the proper sense. Again, the boy must feel that the master's orders represent a higher standard of conduct than that which would result from following his own desires. This higher standard is, in the first instance, that of the traditions and public opinion of the class and school, but ultimately it must be the expression of an ethical ideal of which the boy himself recognizes the validity. It is as the representative of this ideal that the master must exercise authority, while the boy's obedience must be that of loyal co-operation. The master, however, is not a mere machine for carrying out the dictates of some transcendental ideal. The ideal must take a human form in him as a living person. Hence the importance of his personality is enhanced rather

than diminished by the representative character of his authority.

Authority in a class or school ought not, however, to rest solely in the master's hands. A society can enforce the claims of its common interests by methods which will vary according to the aims of the society and the characteristics of its members.

Compelling Obedience. In some cases, the society may act as a body; in other cases, it will act through some person or persons to whom certain executive functions have been assigned. Thus a whole class or school may enforce obedience to its social or ethical code by the pressure of its public opinion, or by the boys combining to inflict some punishment upon an offender; or the right and duty of compelling obedience may be vested in elected or appointed monitors or prefects. Apart from the unorganized methods employed by public opinion and lynch law, the means by which authority is exercised are determined by what in a broad sense may be called the society's political constitution. In such a constitution the social basis of authority may be explicitly recognized in varying degrees. Thus in societies at a comparatively low stage of political development, such as the junior forms in schools, authority is regarded primarily as inherent in some person of exceptional strength or wisdom; while in more mature societies (as *e.g.*, the upper forms in schools) the executive authority must act in accordance with rules known to all the members who thus acquire the power of effective criticism, and perhaps the right to remove a ruler who neglects or exceeds his duty. At a still later stage, the laws are made and the executive appointed by all the members of the society acting either in person or through their representatives. In this way, obedience to authority more and more takes the form of loyal and intelligent participation in the common life.

The evolution of self-government in the schools, which is now proceeding at a rapid rate, is a practical recognition of the social basis of authority. Such self-government has, under favourable conditions, proved extraordinarily effective in securing obedience to a high code of social ethics, and will perhaps be found the most appropriate means of training the future citizens of the State. Its further development will be promoted by the spread of clearer views regarding the functions of authority and obedience in the school's common life.

H. BOMPAS SMITH.

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AUTHORS, THE SOCIETY OF.—The Society of Authors was incorporated under a Board of Trade Licence in 1884, and came into existence chiefly through the efforts of Sir Walter Besant. Its purpose is to represent and assist authors of every kind by protecting their rights and interests. All persons who have already published works are eligible for membership: the annual subscription is a guinea. The official organ of the Society is *The Author*, gratis to members; 6d. monthly to non-members. The Society employs a competent staff to judge the values of authors' manuscripts,

upon which for a fee of one guinea it gives a report. The Society also examines contracts and agreements between authors and publishers: it advises authors as to the publishers best suited for their individual purposes, and dramatists as to performing rights; it examines literary and dramatic accounts, also the estimates of costs of production. The Society protects its members against infringement of rights and breach of contracts, and will take legal action where necessary.

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AUTOMATIC REACTION.—A stimulus to an organ of sense at once arouses into action nerves which stimulate the reacting muscles. The reaction is automatic, as evidenced by the well-known automatic closing of the eye on the approach of an object.

AUTOMATISM.—The theory that animals are mere automata—acting mechanically and not voluntarily. Certain forms of activity are due to internal stimulation, and seem quite independent of voluntary choice. Others are due to reaction from within in response to external stimulation. The automaton theory, according to some writers, excludes consciousness as a factor in producing actions. Under this theory, man is rather a creature of habit than a voluntary agent. For the study of automatic movements, the Automatograph has been constructed, by which records can be made on a plate showing the thoughts of the persons tested, without their being aware of their actions. The person presses his fingers on a plate connected with a glass pencil which he cannot see and, as he thinks of a word, the pencil writes it on another plate without his intention or knowledge.

AUTONOMY FOR TEACHERS.—(See WHITLEY COUNCILS FOR EDUCATION.)

AVENZOAR.—(See CORDOVA, THE UNIVERSITY OF.)

AVERAGES.—The average of a number of quantities is the particular quantity which, being substituted for each of them, produces the same total amount. Thus, if 35 be put in the place of each of the numbers 3, 7, 13, 52, 62, and 73, the total of the six thirty fives will be 210 which is identical with the sum of the separate numbers; and 35 is called the average, or mean, of the six numbers. It lies between the least and the greatest of the numbers, the excess of those that are greater than the average being balanced by the defect of those that are less. To find the average of a number of quantities, divide their sum by their number; *e.g.*, $210 \div 6$ above. A simpler plan, when numbers are large and their differences small, is to adjust the differences only. Thus, to obtain the average of 7150, 7129, 7163, 7133, 7144, 7139, we might take 7140 as an approximate average; the excesses are 10, 23, and 4 (total 37), and the defects 11, 7, 1 (total 19); the net excess is 18. Hence the average is $18 \div 6$ (*i.e.*, 3) above the approximate average 7140. These methods apply to cases where the number of quantities is *definite* (*e.g.*, the price of wheat over a period of years; the number of vessels entering the Port of London daily; school or class attendances; etc.). But other methods must be used when the

quantities considered are continuous variables. To determine average temperature, or average barometric height, a graph is obtained, either automatically or from a large number of successive observations. Simpson's Rule gives the area enclosed within the curve, a base line, and the initial and final ordinates. This area divided by the length of the base line gives the mean ordinate, which measures the required average.

General and Particular Average. The term average is used in shipping business to denote any charge in addition to the regular charge for freight of goods shipped. It is especially applied to the contributions to a loss which are required of those interested, and means also the equitable distribution of the loss and expense among them. In this connection, the average may be *general* or *particular*. General average is the apportionment of loss incurred by voluntary measures taken for the safety of the vessel, such as the sacrifice of part of the cargo, cutting away masts or rigging, or damage done by efforts to extinguish fire. If the vessel reaches port, the average is adjusted there, the contributing parties being all the owners of the ship and its contents, or, more usually, the insurers of them. Particular average is the contribution payable owing to partial loss or damage caused by unavoidable accidents. It is borne by the individual owners of the damaged articles or by their insurers.

AVERROËS or AVERRHÖES.—A famous Arabian philosopher, born at Cordova, in Spain (1126). Under various teachers, he studied philosophy, theology, law, and medicine, and succeeded his father as judge at Cordova. He based his philosophical views on Aristotle, whom he

considered the greatest philosopher; but his works show the influence of the Alexandrian School of Neo-Platonism. He translated Aristotle into Arabic, and introduced Aristotelian philosophy into his exposition of the Koran. His teaching was the cause of many heresies in the Moslem religion, and had a great influence in the Christian Church of the twelfth century.

AVERROËS.—(See CHEMISTRY, HISTORICAL DEVELOPMENT OF.)

AVICENNA.—(See CHEMISTRY, HISTORICAL DEVELOPMENT OF.)

AVICENNA.—(See MOORISH LEARNING AND CULTURE IN THE MIDDLE AGES AND ONWARDS, THE DEVELOPMENT AND INFLUENCE OF.)

AXIOM.—This term, as defined by Dr. Jevons, is a "self-evident truth of so simple a character that it must be assumed to be true; and, as it cannot be proved by any other simpler proposition, must itself be taken as the basis of reasoning." The whole science of Geometry rests on a few axioms. Euclid states twelve axioms, but some of the propositions he proves are as self-evident as some of his axioms.

AZTECS.—The ruling race in Mexico at the time of the Spanish invasion under Cortes. Cortes found a nation enjoying a high state of civilization. Education was entrusted to the priests and priestesses, who formed a powerful order in the State. Both sexes were taught reading, writing, arithmetic, singing, dancing, astronomy and astrology. A system of picture writing was in use, and many of the Aztecs were highly skilled in drawing, painting and other mechanical fine arts.



ANCIENT MONUMENT IN MEXICO

B

BABRIUS.—(See AESOPUS.)

BABYLONIA AND ASSYRIA, EDUCATION IN.

—The material bearing on this subject is widely scattered among the multitudinous literary remains of these ancient peoples, written in the cuneiform character. It mostly consists of incidental allusions, most difficult to collect and arrange. We are deplorably ignorant on many points usually essential to a sketch of the educational system of a people. There is great danger of drawing conclusions unwarranted, even though suggested, by allusions.

Thus Hammurabi, the real founder of the Babylonian Empire, the sixth monarch of the First Dynasty of Babylon, in the epilogue to his great Code of Laws, says: "Let him who is wronged but has a suit to bring come before my image as king of righteousness depicted at the head of the stele on which the Code is inscribed, read my inscription, observe my precious words; my monument shall make known his rights, he shall find justice and rejoice." That obviously implies that the suitor could read the cuneiform inscription, or find some one to read it to him; and we might postulate a very widespread education, at least in reading. This surmise is confirmed by the enormous number of contemporary letters which have been preserved. Not only does the king write to, and receive dispatches, reports, and petitions from, a wide circle of governors, officials, shepherds, even private persons; but the correspondence upon all manner of topics between private persons is considerable. But here a doubt arises, for every letter opens: "To A (the addressed) say—thus saith B" (the writer). Even if this formula was then merely conventional, it suggests that a professional reader was expected to tell A the contents of B's letter. Further, there are positive statements that the even more numerous legal documents, deeds, bonds, receipts, and accounts were drawn up by professional scribes, who would naturally read what they wrote. As the scribe usually set down his name, and as there are evidently many hands to be distinguished in this mass of writings, we cannot conclude that all men and women could read and write. But many men and women evidently could. These documents further show an excellent acquaintance with simple arithmetical rules. In the calculation of areas from the dimensions of their sides, in the extraction of square and cube roots of whole numbers by means of tables, in the many more advanced cases of volumes and simple mathematical tables of factors of the World-Number, we see that considerable knowledge was available. We may say that, even as early as 2000 B.C., the Babylonian people had "the three R's."

Languages. This degree of education had obviously a long development behind it. The examples preserved to us may be fewer and fewer as we recede into antiquity; but, such as they are, nothing forbids our asserting that this stage was already a thousand years old. We find it almost as advanced in the period when Semitic Babylonian was confined as a language to Northern Babylonia;

while Sumerian, a non-Semitic tongue, was still written and spoken in the South. There is overwhelming evidence that the Semites who had settled in Babylonia took over most of the earlier Sumerian civilization. In the times of Hammurabi, we find that, not only did the king set up his great inscriptions in both Sumerian and Semitic, but the scribes drew up long lists of Sumerian words and phrases, with their Semitic equivalents appended in parallel columns. The many poetical, religious, scientific and historical works composed in Sumerian were translated into Semitic; and works consisting of comments, scholia, or explanations, were drawn up. Inter-linear translations appear later, for down to the times of the Arsacid kings, even into the Christian Era, Sumerian continued to be studied in Babylonia as a sacred language. The treatment of this older language has been well compared to the use of Latin in the Middle Ages of Europe. We may say that Babylonia continued bilingual to the last, though doubtless the knowledge of Sumerian was latterly confined to the more educated. From the eighth century B.C., the Aramaic character and, more or less, an early form of Aramaic became familiar. Later, the Old Persian language in a derived cuneiform character, was well known. How far the literature of the Sumerians was the common property of the Semitic population is difficult to estimate. But in the public libraries attached to temples and palaces Sumerian works and their translations existed in vast numbers. Some kings, such as Ashurbanipal, sent messengers throughout the land to collect literary works in both languages from the older libraries. But in many private deed chests along with letters and legal documents, we often find literary works: poems, hymns, and liturgies. Some show by their much bethumbed condition that they were used as prayer-books would be at frequent services in the temples, surely by those who could read them and used to sing or pray the hymns or prayers.

Astronomy and Medicine. By general consent of antiquity, Babylonia was the home of Astronomy. Space will not permit of discussion here as to the age of this knowledge of the heavens; but by Kassite times we are aware of the signs of the Zodiac, of many constellations, of a systematized identification of these with seasons and, through this connection, with gods. In the belief that the configurations of the stars conveyed to men a forecast of the future in a recurrence of the historical events which had once coincided with those configurations in the past, the astrologers built up a vast system of arbitrary rules which could portend coming events. This became, if it was not always so, the chief purpose of stellar observation, but undoubtedly much progress was incidentally made with astronomical knowledge; eclipses were foretold and a rough theory of precession of the equinoxes acquired. Those who acquired such knowledge were highly educated, and the mere astrologers were certainly deeply learned in a most abstruse subject.

The study of medicine was facilitated by a

number of works which enumerated cases of disease, and attached to each a definite treatment and often a prescription, as well as special prayers and exorcisms where the malady was thought to be due to an evil spirit. One difficulty is to recognize the disease and, even more, to identify the *materia medica*. Whether the prescription was based on experiment or arrived at by a fanciful connection between the names and properties of the drugs on the one hand, and the symptoms on the other, is not easy to decide. But a well-educated doctor had certainly done much reading, and probably copying. The value of these medical works, so far as they can be now understood, is doubtful.

In much of this science, it is probable that a sort of philology played a great part. Similarity of sound weighed as much as argument. The scribes drew up vast lists of words associated by sound, of synonyms, or contrasts, doubtless as an aid to composition; but nothing clearly foreshadows any critical argument. Etymology, as then understood, was more cogent than reason.

Arts and Methods of Teaching. Some of the arts, such as sculpture, engraving, weaving, embroidery, metal work, pottery, were very highly developed, and attained a marvellous technique. The arts and crafts were largely confined to guilds of workers; to such an extent that, while a man is often described as son of his named father, grandson of his named grandfather, the place of that grandfather's name is often taken by that of the eponymous ancestor of his clan, or by the name of the guild or craftsman. But apprentices were adopted into the guild, and taught the craft. This is a sort of education, but specialized for each craft. The principle of education was to set a copy and insist on its repetition until learnt. Numerous examples have come down to us of such schoolboy exercises. The teacher wrote a line, in a good clear hand; the pupil wrote beneath it several imitations, often getting worse and worse, as he copied the line above which he had himself just written rather than the model in the first line. But other cases show continuous improvement. Considering the large number of signs (some 460) to be learnt, the acquisition of writing was no mean test of hand, eye, and perseverance. Reading was learnt simultaneously, and only after months of tuition could a consecutive piece of prose or poetry have been given him to read. Probably, judging from the nature of some exercises, the student was set to write out three or four times a word or sentence at which he had boggled in reading. Of anything like a connected treatise on the principles of education, no traces are preserved. But the results were excellent. It is very rare to find a mistake in spelling or arithmetic, in the myriads of tablets written by the official scribes who wrote for the king, high officials, the palace or the temple. Most of these mistakes are such as have now a value for us, indicating local dialect, phonetic representation of unusual or ill-understood words or foreign names. A very acute appreciation of sounds is shown in later times. All along, the writer had to grapple with the difficulty that a script invented to write Sumerian was not adapted to write a Semitic language. But the result is extremely good, and rarely leaves us in any doubt. It puts to shame our modern attempts to reproduce the names of foreign places or people. Space fails us to illustrate by example all the evidence of sound education which allowed each generation, in turn, to master

the achievements of early thought, to acquire and transmit fresh knowledge and new conclusions to posterity.
C. H. J.

BACKWARD CHILDREN.—(See MENTAL HYGIENE OF THE CHILD, THE.)

BACKWARD CHILDREN, SPECIAL CLASSES FOR.—(See BINET, ALFRED.)

BACKWARD PUPILS.—In every school there are children who are described as "backward," on account of their inability to reach or to maintain the same standard of attainment as the average child of their own age. These backward pupils include those not commencing school until a comparatively late age, those mentally below the normal, and those neglected at home or who attend irregularly. The late-comers, if bright, remain backward only temporarily; but the others require special treatment, and are frequently permanently unsatisfactory pupils.

BACON, FRANCIS (1561–1626) is less an educationist than a reformer of intellectual discipline in general; and his pre-occupation as a critical thinker is with the indigence of the intellectual life on the whole side of scientific thought. But, with his ideals and outlook, he could not but be concerned over the primary problem of juvenile training. Before his maturity, there had been not a little discussion in English literature on the faults and follies of ordinary schooling: publicists like Elyot and Lilly, fifty years apart, had discoursed of the heedlessness of parents and the incompetence of ill-tempered schoolmasters and tutors; and professional teachers like Ascham and Mulcaster (*qq.v.*) had written with zest of pedagogic method in general. On these writers Bacon passes no comment, but approaches the subject in his own way. In the *Advancement of Learning* (1605), discussing the drawbacks to learning in respect of the qualities of learned men, Bacon somewhat obscurely notes how, "for meanness of employment, that which is most traduced to contempt is that the government of youth is commonly allotted to them; which age, because it is the age of least authority, it is transferred to the disesteeming of those employments wherein youth is conversant, and which are conversant about youth." Noting further how "the conditions of life of *Pedantes* have been scorned upon theatres as the ape of tyranny; and that the modern looseness or negligence hath taken no due regard to the choice of schoolmasters and tutors," he observes that neglect of education is an ancient complaint against States, and proceeds to pass in its first form his famous encomium upon the Jesuits as teachers, deploring their "superstition," but avowing: "In regard of this, and some other points concerning human learning and moral matters, I may say, as Agesilaus said to his enemy Pharnabazus, *talis quum sis, utinam noster esses* [they are so good that I wish they were on our side]." Perhaps no other Protestant Englishman of that age would have gone so far. Pursuing his general appeal for an intellectual renaissance, he animadverts, early in the second book of the *Advancement*, on the inadequate provision made in the universities for the sciences as distinct from the professions; the lack of endowment of research; the poor pay of lecturers; and the intellectual conservatism which kept studies in fixed grooves.

In the second book there are "two appendices touching the tradition [= transmission] of knowledge: the one Critical, the other Pedantical." The "Critical" comment deals with the need for more judicious editions of standard authors, it having been "wisely noted" that "the most corrected copies are commonly the least correct"; and for better guidance by way of chronological and other annotation, and of a lead to order in reading. Concerning "Pedantical knowledge," he urges "the consideration where to begin with the easiest and so proceed to the more difficult; and in what courses [?] cases] to press the more difficult, and then to turn to the more easy"; and "the application of learning unto the propriety of the wits." He puts the common but questionable theory that "if a child be bird-witted (that is, hath not the faculty of attention), the Mathematics giveth a remedy thereunto; for in them, if the wit be caught away but a moment, one is new to begin." But he adds: "It is an inquiry of great wisdom, what kinds of wits and natures are most apt and proper for what sciences."

Views expressed in the "De Augmentis Scientiarum." It is in the re-cast of these "appendices" in the *De Augmentis Scientiarum* (B. vi, Ch. IV), the expansion (1623) in Latin of the *Advancement*, that Bacon most fully indicates his views on education, putting them with the pregnancy and sententious force which so generally marks his handling of matters of conduct. Taking his later course of appealing to continental scholars for the attention which, after his fall, he feared he would not receive at home, he praises the Jesuits now with no reservation. For boys and young men alike, he prescribes a collegiate education, noting that it promotes emulation, and that association with grave men is disciplinary. On the subject of pedagogic method, he is notably judicious, setting his face against the ideal of simple dosing or cramming with detail knowledge, embraced later by Milton. "For the order and manner of teaching, I would say, first of all, Avoid abridgments and a certain precocity of learning, which makes the mind over bold, and causes greater proficiency rather in show than in fact. Also let some encouragement be given to the free exercise of the pupils' minds and tastes: I mean, if any of them, besides performing the prescribed exercises, shall steal time withal for other pursuits to which he is more inclined, *let him not be checked*." Perhaps no other man of that age, save Montaigne, would have given such a counsel. Over a century later, the authorities of Oxford disdained to act upon it in the case of Adam Smith.

It is here that, after expanding somewhat the general suggestions made in the *Advancement of Learning*, Bacon puts the proposal that acting in plays should be made an element in the schooling of boys. "It is an art which strengthens the memory, regulates the tone and effect of the voice and pronunciation, teaches a decent carriage of the countenance and gesture, gives not a little assurance, and accustoms young men to bear being looked at." Of course, the plays of Bacon's choice would have been didactic, not the stage-plays of Elizabethan and Jacobean England.

Beyond these discussions, Bacon has not committed himself to any educational theories. His observation that "the good or ill thriving of plants depends chiefly upon the good or ill treatment they received when they were young and tender" (*De Aug.*, as cited) puts in the strongest way the

importance of school reform and extension. The short *Essay of Custom and Education*, first published in 1612, deals with education only in the most general sense with the remark: "Certainly custom is most perfect when it beginneth in young years. This we call Education, which is nothing but an early custom." The importance of collegiate education is emphasized, as later in the *De Augmentis*, but only aphoristically.

It might have been expected that in the *New Atlantis* (written in 1624; published in 1627), his sketch of an ideal commonwealth, rightly ordered for all purposes of knowledge, Bacon would have put some view of right provision for education had he completed it; but, as it stands, it ignores the subject. Here Bacon falls behind More, whose *Utopia* he had in mind, and to which he alludes. More, though he has nothing to say of schools, does ascribe to his Utopians studious habits and a usage of lecture-going, and notes that they are taught in their mother-tongue—a protest against the use of Latin as an educational medium for the young in England.

Influence on the Training of Children. Bacon, with all his concern for the spread of scientific research and culture, has nothing to say about scientific training for children. Neither does he ever discuss the education of women; though his mother's special accomplishment in Greek and Latin might have been expected to turn his mind in that direction. Bacon's influence in matters of education has thus been only indirect. His doctrine of right intellectual method, as apart from his success in the application, broadly influenced all intellectual life after his day; and his *Novum Organum* is still rightly valued for its stimulating effect on the mind of youth; but in pedagogics he ranks only as the propounder of a few sagacious precepts and an early admirer of the educational methods of the Jesuits. His counsel as to the educational use of drama has never been generally acted on.

J. M. R.

BACON, SIR NATHANIEL.—The son of Sir Nicholas Bacon, who had been knighted by Elizabeth and, in 1611, was the first to be created a baronet by James I. He was educated at Cambridge. On the monument to his memory in Culford Church (Suffolk), he is described as "well skilled in the history of plants and in delineating them with his pencil." He studied art in Italy, and appears to have discovered a method of mixing a "browne-pinke" colour, which produced a warm and flesh-like appearance in portraits.

BACON, ROGER (1214 [?]–1292).—He claims a place among English authorities on education both as a teacher himself, a writer of educational handbooks, and as the establisher of the tradition of free inquiry which has led to the opening out of many new paths in the world of thought and science. He was born, we are told, at Ilchester, of a well-known Anglo-Norman family, and studied at Oxford, passing in due course to the University of Paris, where he lectured as a Master of Arts in the approved manner of his time. Apart from some travels in France and Italy, he made Paris his headquarters until about 1251, though he had left off interest in university teaching about four years earlier and embarked on a profound study of natural phenomena, which during the next twenty

years cost him a sum (2,000 livres) equivalent in purchasing power to about £10,000 of to-day, spent in "secret books and various experiments, and languages, and instruments, and mathematical tables." A few years after his return to Oxford in 1251, Bacon entered the Franciscan Order (before 1255), and soon after returned to Paris, where he set about the composition of an encyclopaedia of human knowledge founded on entirely new principles. A change in the rules of his Order at this period seems to have had the effect of discouraging him to the point of laying aside his scheme while the great work was still in a very fragmentary state, but meanwhile an account of it had reached the Cardinal of St. Sabina. He became Pope as Clement IV in 1265, and forthwith sent for a copy of the work. Bacon excused himself by letter, urging the rule of his Order which forbade his communicating any writings to persons outside it, to which the Pope answered, directing him, on apostolic authority, to neglect any order or rule to the contrary and to send the work at once. In the meantime, Bacon had been making hurried efforts to complete his encyclopaedia, but, finding the task hopeless, set about the composition of a "persuasion," the *Opus Majus*, on which his chief title to fame rests. Together with this persuasion, he wrote a series of introductions, the *Opus Minus* (now lost in great part), the *Opus Tertium* (recently completed), and a third discovered and printed by Cardinal Gasquet. The *Opus Majus* was, apparently, sent to Rome by the hands of one of Bacon's pupils named John; but, as the Pope died the next year, all trace of the original document or of its reception is lost. Bacon thereupon set to work on his original scheme, but in 1277 he came under the condemnation of the heads of his Order, and from that time onward we lose all trace of him till 1292, when he seems to have been gathering the scattered threads of his teaching into a new scheme under the title of the *Compendium Studii Theologiae*. According to tradition, he died in that year, and was buried at Oxford, 11th June, 1292.

Plea for an Experimental Method. Bacon's influence on the thoughts of his contemporaries and successors was, in the first place, critical. Mediaeval education had over-passed its first rush of enthusiasm and had been directed into a few well-defined channels, specially intended to promote the study of dogmatic theology. Bacon, no doubt, regarded this study as the chief end of education, but he saw the errors of the system of scholasticism by which that end was to be reached. In the *Opus Majus* he points out the chief obstacles to any real knowledge—reliance on authority, established custom, popular opinion, and concealment of ignorance while pretending knowledge. Three arguments were always turning up in any walk of life or study: "This was laid down by our superiors; this is the custom; this is the common view; and therefore it should be held." Now, while this criticism is no more valid in the case of St. Thomas than of Bacon himself (for both accepted the authority of Aristotle), it applies to some extent to Albertus Magnus, and it was in absolute revolt against the whole spirit of scholasticism. Even to-day, much of modern education is open to the same attack. In a later work, Bacon criticizes more especially the theologians of his day for their ignorance of the sciences on which their teaching should have been based, due partly to the monopoly of the study by the two orders of friars, whose teachers had not gone

through the arts course, partly to this course itself not being sufficiently wide in scope.

This criticism was enforced by Bacon's insistence on a new scientific method—the *Scientia experimentalis*—perhaps the most fruitful part of his work. In his own hands it is still an unaccustomed weapon; in some cases he appeals to experience of even the least trustworthy kind, in others he appeals directly to experiment. But to lay it down that the test of an argument was not its logical form, but its capability of verification was to mark a distinct advance in the history of science.

Scholar, Author, Educationist, and Teacher. A second and hardly less noteworthy direction of Bacon's teaching was his attempt at a new classification of the sciences, and his insistence on the value of some neglected branches of them. He reiterated the necessity for an adequate knowledge of Hebrew, Greek, and Arabic on the part of the teachers of the theology, so that they may understand the difficulties of the Scriptures and of Greek Philosophy. He devoted much space to the errors with which the Bibles of those days swarmed, and laid down the conditions to be followed to obtain a perfect text. He extolled the value of Mathematics, and applied it to the correction of the calendar, a reform which had to wait three centuries, but was brought about by arguments taken from his works. He wrote a treatise on Geography, in which ancient ideas were brought to the test of modern travel; a passage of which was one of the persuasives to the discovery of America. He wrote an account of the laws of radiant energy, and a work on Perspective which, founded on Arab sources and his own studies, opened a new science to the West—a work which attained wide popularity in his own times. It cannot be said, it is true, that all these branches of knowledge were absolutely unknown to any of his contemporaries, but for all practical purposes their study did not exist.

We know from Bacon himself that he had written a number of elementary works for the use of youth—"multa . . . conscripseram propter juvenum rudimenta"—but none of these are known. A large volume of the lectures he gave as a Master of Arts in Paris, explaining various books of Aristotle, is preserved, but they have no educational value whatever; in method they are not different from those of any other mediaeval scholar. It was only when he broke entirely with scholastic methods that he took up fresh methods of teaching. He found the necessity of interesting his pupils—"nisi sint pueri qui coguntur per virgam"—and of keeping before them the utility of the subject, after "hundreds of times" seeing them give up at the beginning. In Geometry, he laid especial stress on results; while following Euclidian lines, he insisted on pupils learning the propositions but not the demonstrations. In this way he was "ready to stake his eyes" that he would teach any one who wanted to learn the whole useful range of geometry—more than ordinary mathematicians of his time learned in ten years—within a fortnight. When he had prepared a suitable compendium, he engaged to teach any willing pupil in four years everything that he had learned in forty years of study in sciences and languages. When he said that he would teach enough Hebrew or Greek in a week for a pupil to read and understand everything necessary for the exposition and correction of the Scriptures, he was evidently referring to a very limited range of knowledge, as he himself explains.

Bacon insisted very much on the instruction of youth in moral philosophy, and suggested the use of the Gospels, Epistles, and Proverbs as reading-books instead of Ovid. He seems to have taken an interest in the education of poor children; and in the case of one of them, found at Paris about 14 years old, he paid for his education for five or six years; and when the call from the Pope came, took him in hand himself with such good results, that, according to Bacon, he actually surpassed his teacher in many things because of the excellent training he had received. Unfortunately, we know nothing of the later history of the young man on whom such high hopes were built. Good teachers and good pupils have often done marvels in acquiring facts at high speed without thereby greatly influencing the regular course of education, and Bacon's chief influence on his own time was in the direction of scholasticism (Scot and Ockham are his followers), on succeeding ages of experimental philosophy. R. S.

BACON, ROGER.—(See SCHOLASTICISM.)

BAGDAD. UNIVERSITY AT.—(See MOHAMMEDAN EDUCATION.)

BAIN, ALEXANDER (1818–1903).—He was born at Aberdeen, and was taken from school at 11 years of age to earn his living. By private study and the aid of the Mechanics' Institution, he succeeded in entering Marisburg College (1836), and graduated, in 1840, at the head of the honours list. For a few years he taught moral philosophy under Dr. Glennie, and, in 1842, made the acquaintance of John Stuart Mill (*q.v.*), whom he assisted in the preparation of his manual on Logic. Objections to some of his religious views prevented his obtaining the Professorship of Logic at St. Andrews University in 1844 and again in 1860; but in the intermediate years he lectured at Glasgow, and Bedford College, London, besides holding examinerships for the London University and the Indian Civil Service. In 1860, Bain became Professor of English and Logic at Aberdeen University, and proceeded to improve the teaching of those subjects there. He wrote a manual of *English Grammar* (1863), *English Composition and Rhetoric* (1866), and *English Extracts*, all of which he used with his own classes. For his teaching of logic and philosophy, he wrote *Mental and Moral Science* (1868), *Logic* (1870), *Mind and Body* (1872). He resigned his professorship in 1880, and in 1882 became Lord Rector of Aberdeen University, an honour which he held for six years. During his later years, he wrote a biography of John Stuart Mill, his own autobiography, and a number of philosophical works. He died at Aberdeen, and was buried there. Bain was an educational reformer, especially in regard to methods of teaching; he advocated the teaching of psychology, and of physiology as an aid to an understanding of psychology. In his views on psychology, he followed Mill and opposed Reid and Stewart, the leaders of Scottish philosophy, maintaining that the laws of the human mind correspond to the laws of Nature from which they are deduced. Bain's system of philosophy traces the connection existing between mental operations and the material condition of the body, and the development of mind from the lower states to the higher. His knowledge of natural history and of the physical sciences was applied to his exposition of psychological phenomena in a

manner which went far towards popularizing the study of psychology.

BAIN, ALEXANDER.—(See EDUCATION SOCIETY, THE.)

BAINES, SIR EDWARD (1800–1890).—Journalist, author, politician, and educationist. The close connection of the Baines family with Leeds dates from the commencement of the last century. Edward Baines, Sen. (1774–1848), may be described as the second founder of the *Leeds Mercury*, actually started in 1718, but raised by him from its moribund condition in 1801 to the first rank among provincial newspapers. He also represented the borough in Parliament from 1834 to 1841. His second son Edward, the subject of this notice, took over the editorship in 1818, and he, in his turn, was M.P. for Leeds from 1859 to 1874. The paper is still owned by a company trading under the name of "Baines & Co., Ltd.", but the Baines family do not retain any interest in it. His greatest literary achievement was a *History of the Cotton Manufacture* (1835), which is described in a supplemental volume of the *Dictionary of National Biography* (1901) as still a standard work. But the work which has most interest for his biographer is his life of his own father (1851), both because it necessarily deals with a great number of public transactions in which father and son—as proprietor and editor of the *Leeds Mercury*—were jointly concerned, and because his portrait of his father might well serve for his own. "No one did more with less display . . . To induce him to work it was not necessary that he should be the forehorse of the team. . . . He was firm without sternness, spirited without rudeness, conciliatory without obsequiousness, deliberate without slowness or indecision."

Both father and son were active, quite apart from their political and journalistic interests, in the promotion of popular education, secular as well as religious. But the special claim of the son to be noticed here depends rather on what he opposed (with the full concurrence of his father) than on what he promoted. During the forties and fifties he was the most prominent opponent of State interference with education, and the *Twelve Letters to Lord John Russell* by Edward Baines, Jun., remained for many years, at least for practical politicians, the most authoritative presentation of that point of view.

In the three days' debate of August, 1847, on Lord John's education scheme, though neither he nor his father was at that time in the House, Macaulay, the principal speaker for the Government, taking but little notice of the Opposition speakers who preceded him, went straight for the absent Mr. Baines by name, as the arch-opponent of the broad principle on which he himself took his stand, that "it is the duty of the State to educate the people."

So late as 1864 we find Baines still quoted as the representative of that school of thought. Matthew Arnold, pleading for an upward extension of State education, and answering the argument that our secondary schools were already in course of improvement without compulsion, referred to the unsuccessful use by Baines of the same argument with respect to elementary education, and concluded exultingly: "We left Mr. Baines to sing in the wilderness" (*A French Eton*, p. 96).

But by 1867, Baines himself had ceased to sing

in the wilderness. Addressing a Congregational Conference at Manchester in that year, on the question whether they should persist in refusing Government grants for their schools, in view of their proved inability to compete with the schools which had no such scruples, he said: "I honour the motives of those who reply in the affirmative; but my deliberate and revised judgment answers in the negative."

Subsequently, as M.P. for Leeds, he supported the Act of 1870, including those concessions to the "voluntary" schools to which the bulk of the Nonconformists objected; and, probably in consequence of this, lost his seat at the Election of 1874.

In 1880, his fellow-citizens celebrated his 80th birthday by presenting him with £3,000, to be applied, in accordance with his own wish, between the two educational institutions of which he was President, namely, the Yorkshire College, and the Union of Mechanics' Institutes. In his reply, he touched lightly on the old conflict, intimating that he considered the question to have been decided against him by the popular voice at the Election of 1868, and that he considered the compromise of 1870, which gave effect to it, "one of the greatest and happiest events of the century." He kept up his educational and other public activities almost to his death in 1890.

R. K. W.

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BALANCE.—(See ATAXIA.)

BALL FRAME, THE.—(See ABACUS.)

BALLADS AND LYRICS IN CONNECTION WITH THE TEACHING OF HISTORY, COLLECTIONS OF.—

Teachers of history who fail to make use of poetry miss a great opportunity of illuminating their subject, increasing its charm, and impressing it on the memory. Even if the poem cited falsifies historical facts as badly as the ballad of "Durham Field," which avers that this battle, Crecy and Poitiers, were all fought on a May morning; or the ballad of Agincourt, which asserts that Henry V, after the encounter, "marched to Paris gates"; this is no objection: the pupil learns to discriminate between the values of different historical "sources," and the correction of a mistake fastens the facts upon his mind. A valuable lesson both in historical and in literary criticism is learnt when the pupil grasps the distinction between the traditional ballad, the contemporary song, and the "artistic" poem. To the grown-up reader this distinction may seem so obvious as to be scarcely worth mentioning, but it is not equally obvious to the young; and collections of poems made to illustrate history may obscure it, because the poems are almost necessarily arranged in a chronological

order of the events to which they refer—not in the order of composition.

The Traditional and the Modern Ballad. The value of the traditional ballad of unknown authorship (e.g., the Robin Hood Series, *Chevy Chase*, *Durham Field*, *Sir Patrick Spens*, *Rose of England*) is that it brings us closer than is otherwise possible to the crude ideas, hopes, fears, and beliefs that stirred in men's minds in olden days; and in it we seem to hear, not the voice of any individual composer, so much as that of the people who sang or recited it. Hence, though it may seldom be of much value as a "source" in the sense of contributing facts to our historical knowledge, it is of very great value as a "source" in giving us the thoughts and feelings of contemporaries. Very different, but for teaching purposes not less great, is the value of a modern ballad like Rossetti's *White Ship* or *King's Tragedy*. It is, obviously, not a "source" at all; we cannot appeal to it as historical evidence; but the poet's imagination can help us to live over again the vanished past and share its poignant emotions. So, too, with Macaulay's *Jacobite's Epitaph*—strange as it must ever seem that to the Whig historian we owe the sympathetic lines that tell how the Jacobite exile

"Heard on Lavernia Scargill's whispering trees,

And pined by Arno for my lovelier Tees," sometimes the imaginative reconstruction of the past is so skillful that it deceives the very elect—as Hawker's *Song of the Western Men* deceived both Scott and Macaulay.

Modern Artistic Poems. From Milton onward, there is no lack of contemporary poems that are also artistic poems of first-rate quality, so that we seldom need to refer to such popular poems as possess little literary merit, but had an accidental political importance. Canning's lines to Pitt—"the Pilot that weathered the storm"—may, perhaps, be called the exception that proves the rule. Moore's *Irish Melodies*, or Elliott's *Corn Law Rhymes*, live partly by virtue of their genuine poetry, though political interest gave and still preserves their fame. It is not patriotism alone that gives life to Campbell's patriotic lyrics, though there has been a tendency of late to disparage unduly their poetical quality. Addison's famous comparison of Marlborough at Blenheim to an angel directing the storm has an unique interest. The supreme example of a literary complement, which carried direct political value, it is hardly less important as marking conspicuously a difference in taste between his generation and ours.

Since the sonnet in Milton's hands "became a trumpet whence he blew soul-animating strains, alas! too few," his example has repeatedly borne rich fruit. Greatest of all are the sonnets in which Wordsworth, not without anxious fears for the growing materialism of his own countrymen, upholds British freedom against Napoleon, and mourns the tyranny which has smitten down Venice and Switzerland and the brave negro chieftain, Toussaint l'Ouverture. But we may count as belonging to the same splendid succession of Miltonic sonnets, Tennyson's on *Poland* and *Montenegro*; Rossetti's *On Refusal of Aid between Nations*; and three of William Watson's, wonderfully prophetic of the great European War which has since come to pass. Any study of nineteenth-century England would be strangely incomplete that did not make use of Tennyson's poetry: The

first *Locksley Hall* for the hopes that opened, and the second for the pessimism that closed, the Victorian Era; *Love Thou Thy Land* for the time of the Reform Bill; the *Ode on the Death of the Duke of Wellington* for the nation's feeling at the end of that great career; *Maud* and *Balaclava* for the Crimean War; other poems for the hopes that attended the Great Exhibition and for the new feeling (which he helped to create) about the Colonies. Very powerful and characteristic, again, in their sympathy with the poor and oppressed are Mrs. Browning's *Cry of the Children* and Hood's *Song of the Shirt*. Of later poets, it is enough to mention the socialism of William Morris, the imperialism of Kipling and Newbolt, and the war sonnets of Rupert Brooke.

In the choice of poems to be learned by heart, teachers will give preference to literary excellence—depth of feeling, felicity of expression—rather than historical value. When the primitive ballad rises to the height of *Sir Patrick Spens*, it can hold its own against the finished productions of conscious art; but with so much good poetry available, there is no excuse for using any but the best.

J. H. F.

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BAMBOO-WORK.—(See BASKET-WORK, THE TEACHING OF.)

BANCROFT'S SCHOOL.—(See LONDON CITY COMPANIES AND EDUCATION, THE.)

BAND OF MERCY, THE.—(See PREVENTION OF CRUELTY TO ANIMALS, THE ROYAL SOCIETY FOR THE.)

BAND, THE TRAINING OF A SCHOOL.—The first problem that confronts a musician who undertakes to train a school band is generally that of the composition of the band itself. In girls' schools, it is usually limited to stringed instruments and pianoforte, though a few girls occasionally take up various wood wind instruments—flute, oboe, or clarinet. In boys' schools the orchestra is commonly composed of strings and as many wind instruments as can be mustered (generally speaking, a few wood wind instruments and a cornet or two), with a pianoforte, or harmonium, or both, to fill in gaps in the score.

A good balance of tone may be expected from six first violins, six second violins, two violas, four violoncellos and one double bass; and, if these proportions can be approximately maintained, the number may be increased to any reasonable extent. The number of second violins will probably often exceed the number of firsts; but, as some of the players will be weaker, the whole balance will not suffer. If there is any difficulty in obtaining a viola

or double bass player, it must be borne in mind that a violinist can easily take up the viola if he or she will learn the alto clef and devote a little practice to the instrument; while any member of the school staff, old boy, or old girl, who has had pianoforte or vocal training, and has a good ear and half an hour's leisure a day, can be invaluable on the double bass.

Method of Training. In the elementary training of the strings, an excellent plan is to interest the young players by playing *sostenuto* chords, in order to practise them in beginning and ending together, and in depending entirely upon the conductor's stick for the duration of the chord. Any common chord may be chosen, one note of the chord being taken by each department of the strings, no double-stopping being allowed. The chord may then be played *fortissimo*, and held on for a definite number of slow metronome beats, or for an ordinary pause. The maximum tone being used for the *f* chord, it should be halved for a *f* chord, halved again for *mf*, again for *p*, and again for *pp*.

Sforzando chords may be practised in the same way, *crescendo* and *diminuendo*, and so on for all degrees and variations of tone. If faithfully practised, the results are quick and invaluable. Another thing that is helpful is to make all the young players learn to beat time themselves, practising the various rhythms in turn; this makes them realize what the conductor is doing at the different parts of a bar.

We have always found it necessary to insist upon a school band playing with a *full* tone, by which is not at all meant a loud or noisy tone, produced by scraping or overplaying, but a thoroughly good tone, such as one gets only when intonation is perfect and the individual instruments are in good order. This last consideration is most important, as every conductor knows who plays a stringed instrument himself; but it is too often overlooked, or not realized, even by accomplished musicians who do not know by sad experience into what a parlous state violins and 'cellos can get when neglected. The first and greatest need for the young player is to have his fiddle in good order; the pegs must not stick, nor must they run down; they must work properly or the instrument will never be in tune, and nothing destroys the confidence of a musical person more than hearing himself out of tune with the other players. More time is wasted in a school band by the endless tuning of refractory violins and 'cellos than will bear thinking of. With inexperienced players, the conductor should make himself responsible for the tuning of the instruments—not that he should personally handle and tune them all, but that he should be the judge of whether they are accurately in tune. All the players should, of course, tune to the same standard A, taken either from the pianoforte, or from the oboe, if there is one.

An interesting fact was noticed during a visit paid by Sir Henry Wood to a country orchestra which he was good enough to conduct at a concert. He went to the orchestra room, before the concert began, with a tuning-fork (A = 439, the pitch which we are all trying to regard as fixed at last in this country), which was mounted on a wooden box to increase the volume of sound; and with this tuning-fork he gave the pitch to each player in turn, and made sure that every instrument was really in tune. So much trouble, of course, brought its own reward.

Choice of Music. After these preliminaries, the players will proceed to the study of the music chosen for them by the conductor with a due regard to their capabilities; and here let us say what will perhaps bring down condemnation on us from some strict musicians—that the best way to *get hold* of a school band is to make them study a hard piece of music, something that will immediately rouse their enthusiasm and stir their energies by giving them something at which they *must* work. Side by side with this, practise a piece which is quite simple, and which they can learn to play perfectly. If the band is elementary, and consists of strings and pianoforte only, there are suites by Handel, Purcell, and St. George, all of which afford admirable practice; and there are a number of well-known folk-songs arranged for school bands (Novello's "School Band Music"), which are quite suitable.

If the band contains one or two more accomplished players, there are string concertos by Handel and Corelli which are splendid practice and a joy to work at: these usually require two or three players capable of taking a solo part. As soon as possible, the playing of Haydn's symphonies should be essayed: they are an inexhaustible supply of admirable music, admirably suited to our object. If the band includes a flute or oboe player, so much the better; if a clarinet, he or she will probably have to play the oboe part. If there are no wind instruments, the pianoforte part must be skilfully arranged so as to fill in wind instrument melodies and to strengthen those passages which are for full orchestra; *but the pianist must by no means be allowed to play the notes of the solo passages of the violins or cellos, particularly of the florid first violin part.* This must be arranged by the conductor, and carried out unselfishly by the pianist.

In practice, it will be found quite necessary to work at the string parts, not only in combination, but each by itself; otherwise, in all probability, there will be a great deal of inaccurate playing. Each department of the strings must be prepared to play its part through alone. It is a great mistake to allow all the good violin players to play first violin; some must be kept for the seconds; and the post of leader of the second violins is a most responsible one, calling for intonation which shall set a standard for the weaker players, and for special qualities of courage, musical feeling, and rhythm.

The players in a school band should go to hear symphonies and other orchestral works well performed at every opportunity. G. KIMPRON.

F. A. M.

BANGOR TRAINING COLLEGE.—This was founded, in 1858, by the efforts of the Rev. John Phillips, the North Wales representative of the British and Foreign School Society.

Henry Dunn, the Society's secretary, and others co-operated heartily in the establishment of this training institution for Welsh teachers. Temporary buildings were taken and placed under local management, the British Society giving moral and material support. At first, forty men were provided for, and afterwards, seventy.

The first Principal of the College was the Rev. John Phillips, and afterwards the Rev. Daniel Rowlands ruled for twenty-three years.

Many students have risen to high rank (*e.g.*, Sir John Rhys, LL.D., Principal of Jesus College, Oxford; Sir H. Jones, Professor of Philosophy,

Glasgow; Sir T. Marchant Williams, Inspector of Schools and Stipendiary Magistrate; Griffiths Williams, H.M. Inspector of Mines; and others.

In 1908 the management of the College was transferred to the Local Education Authority, the British Society receiving a rent-charge of £50 per annum, which is applied to the maintenance of bursaries tenable by the students.

Students prepare for the Board of Education and the University Examinations. The college is undenominational.

BANGOR, THE UNIVERSITY COLLEGE OF NORTH WALES.—This was founded as a result of the Report of Lord Aberdare's Departmental Committee (1881). In 1883, a movement to establish a College was started in North Wales, and supported by all parties and denominations; an Endowment Fund was raised, and Bangor was selected as the site by arbitration. In May, 1884, a Principal and Professors in Classics, Mathematics, Philosophy, Physics, and Chemistry were appointed. The College was opened in the following October in temporary premises, and three permanent Lectureships were added—Biology, Modern Languages, and Latin; the first two have since been replaced by Chairs of Botany, Zoology, French, and German; and the third raised into a Professorship. The following Chairs have subsequently been established: Agriculture, Welsh, Education, Semitic Languages, and Forestry. Sixteen Assistant Lecturers and Demonstrators have also been added. The College enjoyed from the first a Treasury grant of £4,000 a year, which in 1909 was doubled on the report of a special Advisory Committee. In 1902 the accommodation having become inadequate, the City Council presented the College with a fine central site of 10½ acres. The Treasury made a building grant of £20,000, and about £95,000 was raised by public subscription. The foundation stone was laid by King Edward VII in 1907, and the completed new buildings were opened by the present King in 1911. This block contains the Arts Departments, Administrative Section, Library and Museum (the gift of the Drapers' Company), Great Hall (the gift of Sir John Prichard-Jones, Bt.), and Dining Hall. The science work is still carried on in the old buildings. The Teachers' Training Department (Primary, Secondary and Kindergarten) for men and women was established in 1894; admission is confined to matriculated students of the university.

The Agricultural Department, started in 1888, was the first established in connection with any university college. It embraces both in-college and extension work, and is supported by the Board of Agriculture, with substantial assistance from the County Councils of North Wales. The number of teachers has grown from two in 1888 to fifteen at the present time, including the Forestry staff. The Forestry School is one of the five in Great Britain maintained by the Board of Agriculture. No provision has yet been made for mining and quarrying, the other great industries of North Wales, but this is in contemplation.

The number of students rose from 58 in 1884 to 536 in 1919, of whom about 158 were women. There are two residential hostels for 120 women and 37 men respectively; other students live at home or in registered lodgings. The great bulk come from the secondary schools of North Wales. The average age of entrance is a little over 18, and the usual period of residence from three to four years. The

lectures and classes, which up to 1893 were adapted for London University, have since followed the lines prescribed by the University of Wales, of which the College is a constituent body.

Since its foundation the College has received gifts and legacies for buildings, scholarships, and General Fund, amounting to £231,700. There are several post-graduate studentships founded by the late Dr. Isaac Roberts, F.R.S., and Lady Osborne Morgan, and, out of the increased Treasury grant, fellowships and studentships in the University of Wales have been established, which are open to the students of its constituent colleges. (See also WALES, UNIVERSITY OF.) H. R. R.

BANKERS, THE INSTITUTE OF.—This was founded in 1879, and is an association of those connected with the various branches of banking, and aims at promoting the interests of the banking profession, especially by watching legislative proposals.

The Institute provides those who are interested in banking with opportunities for discussing matters of interest to them and, when advisable, it takes measures to further the decisions arrived at by its members. It also gives opportunities for acquiring knowledge of the theory of banking.

The members of the Institute include Fellows, Associates and Certificated Associates and Ordinary members. All members have a right to be present at the meetings and to take part in the discussions. During the winter, courses of lectures on banking are given in London and other towns.

Classes in commercial French, German, and Spanish are held at the Institute Rooms, 34 Clements Lane, London, E.C.; and diplomas in these languages are awarded. The Institute also offers scholarships in each language, entitling the holders to spend two months in a bank abroad.

The Institute publishes a monthly *Journal* from October to June, containing papers read at the meetings; lectures, answers to questions on matters of interest asked by members; with useful information on banking, current events, legal decisions, etc. The *Journal* is distributed free to members.

The Certificate of the Institute. For the benefit of junior members, examinations are held in London in April of each year for the certificate of the Institute. The first examination is of a preliminary character, the second of a more advanced type. None but members may take the examination, and a fee of 5s. is paid for each part. The subjects of examination are: Economics, Practical Banking, Commercial Law and Book-keeping in both examinations; Commercial Arithmetic, in the Preliminary only; English Composition and Banking Correspondence in Final only; with French and German, optional in both examinations. Valuable prizes are given to candidates obtaining the highest aggregate and the highest marks in certain individual subjects.

The Institute has a library of over 6,000 volumes on banking and kindred subjects, and a reading room. These are open daily to members, who have also the privilege of borrowing most of the books.

BANKING, THE TEACHING OF.—Among bankers there is a familiar aphorism that a bank is the only place in which a thorough knowledge of banking can be acquired. Probably the author of the saying was considering banking, not in its mere technical aspect, but as an art, as one of the

higher branches of business. Looked at from this point of view, the business of banking demands from its exponents many qualities which, though one would not go so far as to say they cannot be taught outside a bank, are certainly outside the curriculum of most teachers under existing conditions.

Bank Managers. The successful banker, under which term is included the bank manager and those other officials upon whom devolves the responsibility of directing and controlling the affairs of a bank, must have a large share of those attributes which bring success in almost any branch of business. He requires a cool head and a hard head, the ability to read other men and to manage them, a sound judgment, self-reliance, the capacity for coming to a prompt decision, and the courage to carry through that decision to its logical conclusion. Teaching which confines itself to imparting the mere technicalities of banking, without training the student in the exercise of those mental powers which are necessary for the efficient use of the knowledge so acquired, is obviously imperfect and one-sided, and is often the cause of the suspicion and distrust with which the successful business man is apt to regard the possession of an educational certificate.

Bankers' Examinations and Training. If this is granted, it follows that great importance must be attached to the personal relation between teacher and student; for it is only by personal contact that the more practical virtues can be developed. Men are not born with equal mental powers, and the study of individual characteristics and the correction of individual idiosyncrasies form an important part of the teacher's work. It may be thought that the task allotted to the teacher is too severe, and beyond the powers of most of those upon whom the duty devolves. If so, it is because we are apt to underrate the importance of the rôle played by the teacher, especially the teacher of commercial subjects. Judged by the standard just laid down, it is plain that much of the teaching to which the young bank clerk has access falls very short of the ideal, lamentably so in many cases. This is, in part, due to mistaken ideas which are prevalent as to the value of examinations, and frequent confusion of thought as to the proper relation of teacher and examiner. Examinations are now regarded as one of the most important and necessary adjuncts of any educational system, and, open to abuse though they are, it is difficult to see how they can be dispensed with. Examinations hold up before the student a standard of efficiency, without which much of his effort would be dissipated; they add a spur and a zest to his work, and afford a definite aim towards which his exertions may be directed. But examinations, it should be remembered, are merely tests that the teaching has been thorough and that the student has been able to assimilate some of the knowledge which the teacher has endeavoured to impart. The mistake is far too frequently made, both by the teacher and the student, of regarding the passing of an examination as an end in itself; and the ability to prepare a candidate with the minimum of effort and the shortest course of reading is often wrongly regarded as a test of good teaching. The "correspondence college," which, in many instances, takes, as the basis of its teaching, the mere preparation of answers to questions set in previous examinations, affords an example of the

worst possible type of teaching. The knowledge so acquired tends to be superficial and scrappy, and the student would often derive far more benefit from an unassisted course of reading. The effort would certainly be greater; but there is no royal road to knowledge and the mere expenditure of this effort is one of the surest methods of gaining an accurate and lasting knowledge of the subject studied. "Easy come, easy go," is perhaps truer as regards educational methods than in the case of money.

Moreover, teaching of this kind lacks the element of personal relation between teacher and student, which is so essential for the formation of business habits and for the training of the intellectual faculties. Many of the attributes of the successful banker alluded to above can only be developed from experience, and the earlier the young man can be entrusted with a little responsibility, the more rapidly will his faculties mature. But, however young he be, the teacher can wield a powerful influence in restraining and directing his natural tendencies, and correcting his weaknesses.

Clearness and accuracy of thought should always be encouraged. In every branch of business the man with a smattering of knowledge is an object of dread to his superiors, because such a man is apt to draw erroneous conclusions and forthwith to act upon them. Every examiner is familiar with the man who attempts to answer every question, and covers his lack of real knowledge with vague generalities. In a business, such as banking, thoroughness is essential, and the scope of a student's reading should, therefore, be deep rather than wide. He should be encouraged to think out his difficulties for himself, and constant tests should be applied to prevent superficiality.

Success in Banking. The successful banker is nearly always a man of cautious and conservative temperament rather than a brilliant thinker. All over the English-speaking world, it will be found that a very large proportion of the most responsible banking appointments is held by Scotsmen. Needless to say, this is not due to chance or favour. It is due to the fact that the Scot is by nature a solid thinker, with a full appreciation of the value of accuracy in detail, which the Englishman, with equal intellectual ability, is too apt to scorn. In the lower departments of a bank, the successful conduct of routine operations plays a very important part, and the young banker should be trained to realize the necessity for concentration and application. Those who are familiar with the internal affairs of a bank know that mistakes occur more frequently on the days when the work is not heavy, than at times when pressure is greatest. At the latter time, the faculties are keyed up and everything combines to compel intense concentration; while on occasions when there is time to spare, the attention is apt to wander. The young clerk should further be taught the value of considered action. Youth is impetuous and zeal sometimes outruns discretion. "The more haste, the less speed," is a time-honoured proverb which holds good in business, and the effort to win the race at too early a stage may result in disaster.

Technical Equipment. With regard to the technical portion of the young banker's equipment, it will hardly be going too far to say that a thorough knowledge of the English language is of primary importance. It is astonishing how few men are able to write a really good business letter,

especially when we remember that the general manager or other official who has control over a large staff has few opportunities of personal intercourse with its individuals, and that a clerk's correspondence may have a deciding influence in the formation of the manager's opinion of his capabilities. Similarly, the bank's customers cannot but be favourably impressed by a skilfully-written letter, while a slovenly and ungrammatical correspondent will rarely inspire confidence. There is a very widespread fallacy that the art of letter-writing requires little or no study, and many men possess a complacent belief in their own powers as a correspondent, simply because their knowledge is insufficient to enable them to recognize and realize their own shortcomings. In the examinations of the Institute of Bankers, the percentage of unsuccessful candidates in English Composition and Correspondence is almost invariably greater than in any other subject, and the answers of the candidates show conclusively that many of them have devoted no serious study to the subject, but rely on their general knowledge. Not only is a knowledge of the laws of grammar and style necessary, but to become an efficient letter-writer demands the possession of an ear for language which only training and experience can impart.

Another subject of first-rate importance to the would-be banker, is the law and practice of cheques and bills of exchange. As a general rule, the amateur lawyer is not to be relied upon; but the law of bills and cheques, which was one of the first branches of law to be codified in this country, is so concise and self-contained, that it presents few snares to the intelligent layman. The maxim that ignorance of the law excuses no one, is applied with more than usual strictness against bankers, and the Courts are quick to attribute negligence to the bank which omits the precautions enjoined by the code, and to deprive it of the useful protection which the code affords.

In addition to a knowledge of bills and cheques, the student should study the structure of the English banking system and its relation to the London money market. He should, further, become thoroughly familiar with the relations of banker to customer, more especially with regard to the ordinary dealings on current account, the various classes of security lodged with a bank as cover for advances, and the proper methods of handling such securities. He should learn to understand and analyse a bank balance sheet, and should acquire a knowledge of the general principles of the foreign exchanges.

The teacher should remember that any one whose work lies within the walls of a bank will acquire a practical familiarity with some or all of the ordinary banking transactions and the documents used in carrying them through, and he should enjoin on the student the necessity for observation and for applying to his daily work the lessons learned in the course of his study. Much of the routine of a large joint-stock bank is carried out in conformity with a carefully compiled series of instructions issued by the head office of the bank, and many men are content to carry out these instructions without seeking the reasons by which they are inspired. Mental indolence is, in some cases, the obstacle; in others, it is due to sheer inability to recognize the connection between theory and practice—a mental state which is often the result of incompetent teaching. The really competent banker must nowadays have a fairly complete

acquaintance with commercial law, though the knowledge so acquired must be used with caution. Without such a knowledge, however, he may walk blindfold into difficulties against which a study of legal principles would have put him on his guard. The branches of law to which his attention should chiefly be directed are company law, the law of contract, the law of bankruptcy, and the law relating to negotiable instruments. A knowledge of mercantile book-keeping is essential, and the young banker should be specially trained in estimating the value of a balance sheet from a lender's point of view, bearing in mind that this point of view differs essentially from that of the accountant.

Text-books. With regard to the choice of text-books, the Institute of Bankers publishes an examination syllabus, which contains a carefully selected list of books recommended for the use of students. Most teachers try to cut down the list to a minimum in a mistaken endeavour to spare the student unnecessary effort. Such a method of teaching is wrong. However good the text-book may be, it is in very few cases good enough to stand alone. An author's views of his subject are necessarily limited by his own personality, and there is no better mental discipline than to study two or more text-books dealing with the same subject, and to compare and reconcile the opinions of the several authors. E. S.

BARBADOS, EDUCATION IN.—(See JAMAICA AND THE BRITISH WEST INDIES, EDUCATION IN.)

BARBAULD, ANNE LETITIA (1745–1825).—Was the daughter of the Rev. John Aikin, D.D., a dissenting minister, who kept a school at Kibworth Harcourt in Leicestershire. She developed an early taste for poetry and, in 1773, a volume of her poems was published, as well as miscellaneous pieces of prose, to which her brother contributed. She married in 1774, and with her husband opened a boys' boarding school at Palgrave (Suffolk). Her literary talents and her skill in teaching did much to promote the success of this school, and during her life at Palgrave she published her *Early Lessons for Children*. Between 1792 and 1795, Mrs. Barbauld and her brother published a series of papers known as *Evenings at Home*, and in 1810 she published an edition of *The British Novelists*. Her graceful and easy style is well illustrated by the short piece commencing "Life! I know not what thou art" (*Golden Treasury*, ccvii). Her last poem, *Eighteen Hundred and Eleven*, contains the same thought as was expressed by Volney in his *Ruins* (1791), and by Macaulay in his essay on *Ranke's History of the Popes* (1840), of the future traveller visiting the sites of modern cities and lamenting over their ruins.

BARBAULD, MRS.—(See EDGEWORTHS AND THEIR CIRCLE, THE.)

BARCELONA EXPERIMENT, THE.—(See MONTESSORI SYSTEM IN SENIOR SCHOOLS, THE.)

BARET, JOHN.—Was at Trinity College, Cambridge, in 1555, as a teacher of Latin, and died about 1580; but the details of his life are uncertain. He is chiefly notable for his dictionary, published about 1574, under the title of *An Alvearie, or Triple Dictionarie in English, Latin, and French*, and dedicated to Lord Burghley. The plan of the

dictionary is to give an explanation of each English word followed by its equivalent in Latin and French. Occasionally, references to the Greek occur; but in a subsequent edition, Greek took a prominent place, and the book was described as *An Alvearie or quadruple Dictionarie containing foure sundrie languages, namely, English, Latine, Greeke, and Frenche, newlie enriched with varietie of wordes, phrases, proverbs, and diuers lightsome observations of Grammar*. Baret called his dictionary an "alvearie," or beehive, because many of his pupils, during many years, collected the material used in compiling it.

BARNARD, EDWARD (1717–1781).—He was educated at Eton and Cambridge, and was a Fellow of St. John's from 1743 to 1756. For a few years, he was at Eton as a private tutor, but became head master in 1754, and his influence greatly raised the number of pupils in the school. Hardinge, who was under him at Eton, describes him as coarse and ungainly, but possessed of much humour, and ruling his pupils chiefly by ridicule. He was made Provost of Eton, and a tablet to his memory is in Eton College Chapel. He was an intimate friend of Dr. Johnson. In Boswell's *Life of Johnson*, there is a letter giving an account of a gathering of ladies and gentlemen to meet Johnson, the company including Lord Althorp, Sir Joshua Reynolds, and the Duchess of Beaufort, while the chief speaker was Edward Barnard.

BARNARD, HENRY (1811–1900).—One of the most prominent American educational administrators of the nineteenth century. He visited Europe (1835) to study educational methods, and in 1837 became secretary to the Connecticut Board of Education, founded at his own suggestion. In 1839 he organized the first institute for the training of teachers. From 1843 to 1849 he was engaged in organizing education in Rhode Island. Town libraries, popular lectures, and travelling model schools were some of the means he employed to promote education. From 1851 to 1855 he was again Secretary for Education in Connecticut, and in 1854 represented the United States at the London Educational Congress. In 1855 he commenced the publication of the *American Journal of Education*, which he edited for twenty-six years, during which he wrote many educational papers, and was for a period the United States Commissioner of Education. He left many valuable works on the history, theory, and practice of education, and accounts of educational reformers and of national systems of education.

BARNARD, HENRY.—(See UNITED STATES OF AMERICA, EDUCATION IN THE.)

BARNARDO'S HOMES, DOCTOR.—The Homes which bear this name—*Barnardo*—are in the hands of a National Incorporated Association, but were founded and for many years maintained by the personal efforts of Dr. Barnardo alone. The philanthropist was born in Ireland, and came to England to study medicine at the London Hospital. He became personally acquainted with numbers of poor boys and girls of the labouring classes through working in a voluntary night school, and he learnt much about their privations and sufferings. His schoolroom he described as "a poor donkey-shed in an East End street," and there he first encountered



The Queen's University of Belfast

Photo by Valentine



Berlin : The University

Photo by F. Frith & Co.

PLATE X

a specimen of the genuine homeless City "arab." Through this child, Dr. Barnardo discovered that London contained large numbers of children who were absolutely homeless and destitute. The discovery determined his subsequent career, and from that time (1867) he devoted his life to the rescue of such waifs. Beginning in a small way, without assistance at first, he opened "a little house in a mean street for some twenty-five boys." He did his own repairs to the house, and then spent two nights hunting for the twenty-five homeless lads. The work prospered greatly and rapidly, and soon drew support from sympathizers. In the first two years, Dr. Barnardo received donations amounting to £214, and in the next year £818. In 1871, £7,000 was received, and the yearly sum rose above £100,000 in 1889 and above £200,000 in 1907, and has twice exceeded £250,000.

The charter of Dr. Barnardo's Homes has always been "No destitute child ever refused admission." There are no elections; no waiting list; and no barriers on account of age, sex, creed, nationality, or physical health. A thousand children are permanently admitted every year, over 7,000 are always being supported and trained, and over 80,000 have passed through the rescue doors. The Homes endeavour to bring all their inmates under definite religious influences, and to secure a religious upbringing in the tenets of the Church of England, or as a Nonconformist, according to parentage (if it can be traced).

The agents of the Homes seek out in our great cities such helpless children as would, but for their intervention, probably become tramps, loafers, and eventually paupers or criminals. Food and shelter are freely given at the "ever-open doors" to any child-wanderer who applies.

The Homes adapt their methods of upbringing to the needs of the inmates. There are industrial homes for healthy boys and girls; special homes for babies, cripples, incurables, delicate and convalescent children; a garden city for boys; a village home for girls; and a naval training school.

Industrial and technical training is given to both boys and girls wherever possible.

An extensive and carefully supervised system of boarding out is carried on by the Association. More than a half of the children are boarded out either in England or in Canada.

Very large numbers of the Barnardo children are emigrated every year to Canada and the Colonies.

Institutions in England. The four chief English Homes are: (1) Boys' Home, Stepney; (2) Girls' Village Home, Barkingside; (3) Boys' Garden City, Woodford Bridge; (4) Watts's Naval Training School, Elmham, Norfolk.

Nos. 18 to 26 STEPNEY CAUSEWAY, LONDON, E.1, comprise the central offices and a home in which 200 boys are regularly in training. They are nearly all over school age, and are generally apprentices to trades, each of which is carried on in a separate school under well-qualified technical instructors. The Stepney Home has a Home Brass Band, as well as performers on hand-bells and other musical instruments.

THE GIRLS' VILLAGE HOME is the largest branch establishment. It consists of sixty-seven cottages and fourteen other buildings, where the girls live in natural conditions. Every year large numbers are emigrated to Canada, or sent to service in England. At this Home, girls are admitted from infancy upwards to 16 years of age. The training includes

all branches of useful work for women, and the output of dressmaking and laundry work is very large.

THE BOYS' GARDEN CITY was opened in 1912 by H.R.H. the Duchess of Albany, under a scheme providing for thirty houses. The situation is a great contrast to that of Stepney, and the improvement in the health and physique has been very marked. Here the ages of the inmates range from 4 to 16 years. In addition to the usual handicrafts taught in the Stepney Home, the boys learn gardening and basket-making.

THE WATTS NAVAL TRAINING SCHOOL is so named after Mr. E. H. Watts, of the shipping firm Watts, Watts & Co., who in 1901 presented to the late Dr. Barnardo the large building and extensive grounds in which is carried on the work of training boys for the Navy and Mercantile Marine. There are usually about 300 boys in residence, and a training ship is attached to the institution. At the Walrond Institute, Great Yarmouth, the naval base of the school, special instruction is given to selected intelligent boys in gunnery and seamanship, as well as in ordinary scholastic subjects. The Watts School receives Admiralty gratuities for many of its pupils. In the European War, Barnardo boys distinguished themselves time and again in naval engagements, and some lost their lives in the defence of their country.

Large numbers of the perfectly healthy children are *boarded out* in cottages carefully selected within a radius of about a hundred miles of London.

For the preservation of the health of the children, the Association provides hospitals, sanatoria, and special homes; surgical appliances are provided for cripples, and X-ray installations are in operation in two of the hospitals.

Management. The management of Dr. Barnardo's Homes is carried on by a number of clerical association secretaries, two ministers, and two laymen of the Free Churches. Numerous lady speakers and others devote the whole or part of their time to advocating the work of the Young Helpers' League, which has led thousands of children in comfortable homes to join in the work of rescue.

Details of the work of the Homes are to be found in the Annual Report, *Night and Day* (quarterly), the *Young Helpers' League Magazine* (ten times a year), *Ups and Downs* (quarterly), *The Barnardo Boys' Magazine* (monthly), *The Guild Messenger* (quarterly), *Jack Tar* (monthly), and in a number of albums and booklets. For helpers who organize lectures and entertainments, cinematograph films and lantern slides are lent by the Lantern Department. A lecturer visits annually many of the great schools of the country to supply information and arouse sympathy, as well as to raise funds for the carrying on and extension of the work of the Homes.

BARNETT, SAMUEL.—(See TOYNBEE HALL and UNIVERSITY SETTLEMENTS.)

BAROMETER, STUDY OF THE.—This is an important part of the work of the Meteorological Office, South Kensington, which was established in 1854 as a Department of the Board of Trade to collect and utilize meteorological observations made at numerous stations in and around the British Isles. Only by observations taken at different places, and a comparison of the changes in pressure at those places can any inferences be drawn justifying a forecast of weather. The words "Rain,"

"Change," etc., upon the barometer are valueless to the meteorological student, who must devote his attention rather to the rate and the direction of the changes in the height of the mercury. In England, fine weather is usually certain when the height is 30 in. or over, especially if the barometer remains steady or changes slowly. Dry winds, especially east winds, are frequently accompanied by a steady high pressure. Sudden changes are common accompaniments of high winds, and indicate variations within limited areas. It is at such times that the Meteorological Office is able to issue useful warnings of changes. The Meteorological Office figures in the daily newspaper reports are corrected to sea-level. The student must remember that the greater the elevation, the lower will be the barometer, so that at such a place as Ventnor the readings at the top of the town will be different from those at sea-level. The *Calendar of Whitaker's Almanack* gives barometric readings for every day of the year; but to appreciate their value it is necessary to associate with them the other records side by side with them: direction and force of wind, temperature, and rainfall. For instance, in February, 1910, we find the lowest barometric reading associated with the strongest wind and heaviest rainfall, while the highest reading occurred on one of the three rainless days. Again, in September the readings were above 30 in. on twenty days, and the lowest reading was 29.854. Rain fell slightly on two days and heavily on the 15th, when the wind was strong and the barometer showed 29.863. Temperature was very uniform, and wind was north to north-east for nineteen successive days. A special study of the barometer is of great value in agricultural districts, and the barometer itself is a very common and well-used instrument in many farmhouses.

BARRI, GERALD DE.—A Norman-Welsh bishop of St. Davids in the twelfth century, usually known as Geraldus Cambrensis. He accompanied Prince John on his visit to Ireland in 1185; and wrote his *Topography of Ireland*, shortly followed by his *History of the Conquest of Ireland*, both in Latin. In 1188 he accompanied Archbishop Baldwin in a crusade through Wales, and wrote his *Itinerary of Wales*. These books are the earliest examples of English popular literature and, besides being valuable historical records, are vivid, picturesque, and amusing. (See J. R. Green's *Short History of English People*, III, i.)

BARRING OUT.—"The practice of *barring out* was a savage license, practised in many schools to the end of the last (17th) century, by which the boys, when the periodical vacation drew near, growing petulant at the approach of liberty, some days before the time of the regular recess, took possession of the school, of which they barred the doors, and bade the masters' defiance from the windows" (Johnson: *Life of Addison*, 1780). Johnson refers to a story of a "barring out," in which Addison was concerned during his school days at Lichfield School.

BARRISTERS, THE EDUCATION OF.—It seems to be the accepted view that the existence of the English Bar, as a profession, dates, like that of the cognate profession of attorneys and solicitors, from the close of the thirteenth century, when the jurisdiction of the local and feudal tribunals,

exercised by virtue of ancient custom which varied from place to place, was being superseded by the scientific and uniform procedure of the new royal courts which, after a fierce struggle, had just made good their supremacy. Even at this early date, the advocates in the King's Courts appear to have been divided into two classes: The first, known as "serjeants-at-law," were really Crown officials, appointed by Letters Patent, and, at least in later days, holding a valuable monopoly of audience in the great Court of Common Pleas, as well as of succession to judgeships in that Court; the second class of "apprentices" would appear, by their designation, to have been originally persons qualifying by apprenticeship for the responsible position of serjeant, and, probably, not entitled, as of right, to audience in the courts. It is, however, one of the curiosities of the history of professional education that, certainly not later than the end of the fourteenth century, the serjeants separated themselves completely from their humbler brethren, and set up "inns" or colleges of their own, which, so long as the valuable monopoly previously alluded to continued, must have been centres of great influence. They do not, however, appear to have undertaken any directly educational functions; and the training of the "apprentices" fell to the ultimately more important Inns of Court (*q.v.*), which, with the final settlement of the three great Courts of Common Law at Westminster, grew up as seminaries of that new "common law of the land" which, in sharp contrast with the Civil (*i.e.*, Roman) Law and Canon Law administered by the ecclesiastical tribunals, was being formulated and enforced by the King's judges.

The Advance of Apprentices. It is tolerably clear that these voluntary societies for centuries fulfilled their educational functions, partly by formal lectures, or "readings," delivered by their senior members at stated intervals, and partly by "moots" or disputations conducted among the junior members, doubtless under the supervision and guidance of the seniors. But, probably, not the least valuable part of the professional education of the "apprentice" was derived from his habit of attendance in the courts themselves during trials: a practice which was officially recognized in the arrangement of the court buildings down to the middle of the nineteenth century. It is at least plausible that we owe that priceless series of reports of the proceedings of the King's Courts in the Middle Ages, known as the "Year Books," to the notes taken by "apprentices," and handed on from generation to generation. Before the discovery of printing, such notes were almost indispensable authorities to an ambitious student desirous of securing a reputation as an expert. The habit of attendance in Court led to a distinct rise in the status and emoluments of the "apprentices." Though there appears to be no direct or clear evidence of that "bounden" service to an individual master which was the feature of apprenticeship in most callings (including that of attorney or solicitor), it is highly probable that, in their own interests, eager "apprentices of the law" would strive to make themselves useful to the dignified and powerful serjeants who addressed the judges in Court, or received clients in the nave of St. Paul's Cathedral. But, apparently, they also succeeded, by their skill and knowledge, in making themselves useful, in a humble capacity, to the judges themselves, who, from time to time, would

put questions of practice or law to them, and receive their answers. They thus gradually acquired the valuable right of audience, and therewith, naturally, an independent status as legal advisers towards the public, who, in less important cases, and for preliminary details, would consult them directly. Thus the consultations in the Temple Church gradually became rivals of the consultations with the serjeants in St. Paul's, and the "apprentices" a rival branch of the advocates' profession; though the inferiority of the apprentices to the serjeants was marked by the fact that, while the latter sat in the Court itself, the "apprentices" addressed the judges from behind the bar which fenced off the general public, and thus acquired the name of "barristers." This right of audience was certainly acquired before the end of the sixteenth century; for the great Plowden, in his famous reports of cases during that period, often modestly describes his own learned arguments as those of "an apprentice of the Middle Temple."

"Barristers" and "Students." It is not to be supposed, however, that any raw student would be allowed to waste the time of the judges with irrelevant arguments; and, accordingly, we find that there synchronizes pretty closely with the acquisition of professional status by the "apprentices," a further subdivision of the forensic branch of the legal profession into "barristers" and "students" (*i.e.*, learners not entitled to audience in the Courts). This distinction was well established by the time of Coke, who, in his interesting if somewhat imaginative picture of the Inns of Court, describes these fledgeling lawyers by the suggestive name of "mootmen"; while he further subdivides "barristers" into "juniors" and "ancients" or "benchers." The latter, who must have been qualified as barristers for at least twelve years, seem to have had no special status in the Courts, but to have acted as members of the governing bodies of the Inns, and thus to have acquired that valuable monopoly of the entrance to the forensic branch of the profession which they still enjoy. Thus, the profession of the Bar had, by the end of the sixteenth century, become virtually self-governing and exclusive; though the right of appeal from a decision of the "benchers" of his Inn to the assembled judges still remains open to the aspirant for a "call to the Bar," and marks the theoretical survival of the origin of the profession.

King's Counsel. The seventeenth century witnessed two further important changes in the organization of the English Bar. The first was the appearance of specially privileged advocates, known as "King's Counsel," who, though inferior in standing and dignity to the serjeants, yet enjoyed, like them, by virtue of their Letters Patent, precedence over the ordinary barristers, and the right to a seat "within the bar." One of the earliest of these new "patent counsel" was Francis Bacon; and it is at least suggestive that, though the new order was distinctly a Crown creation, having nothing to do with the domestic arrangements of the Inns, yet in Gray's Inn, of which Bacon was a distinguished ornament, King's Counsel have long enjoyed exceptional and peculiar privileges.

The Exclusion of Solicitors. The other great change which came about in the seventeenth century was purely informal, but far more essentially important to the professional status and prospects of the barrister. The examples of those members of the Bar who had played such leading parts in

public affairs during the Civil War and the Commonwealth, naturally begot in the eyes of their colleagues a sense of the dignity and importance of their profession, and with it a desire for exclusiveness. During the later years of the seventeenth century, one of the forms taken by this enhanced sense of dignity was a movement to exclude from membership of the Inns of Court those attorneys and solicitors who, when the "apprentices" acquired full professional status as barristers, apparently stepped into the relationship towards them which they, as "apprentices," had formerly occupied towards the serjeants. The movement was successful; but, as Roger North points out, the triumph of the barrister was attended with the serious consequence that the excluded attorney, who had formerly acted very largely as a mere assistant of the barrister, now acquired a powerful and independent position, especially towards the public; and soon succeeded, in substance (though the Bar has always refused to admit the change in theory), in excluding barristers from direct intercourse with lay clients, at any rate otherwise than through the intervention of the attorney or solicitor. Whatever the gain to the public by this division, it certainly has the effect of making the fortunes of the individual barrister depend largely on the goodwill of solicitors; and it is probably responsible also for that concentration of forensic business in the hands of a few leading members of the Bar which is such a conspicuous feature of the legal profession. For, while the youthful solicitor has at least a chance of acquiring a few clients through family or social ties, or chance acquaintance, the youthful barrister may have to wait weary years before his abilities become known to solicitors, who, though often "on the look-out for a good man," have not much time to spare from busy practice to prosecute the search.

Legal Education in the Nineteenth Century. During the eighteenth and early nineteenth centuries, legal education suffered from the same stagnation which fell upon education elsewhere. Nominally, the "readings" and moots continued in the Inns of Court; actually they fell into decay or became mere forms. The Readerships, formerly conferred on the most eminent among the Benchers, passed in rotation and became mere sinecures. The exercises or moots of the students became a farce; and mere residence, which ultimately degenerated into attendance at dinner in Hall on a certain number of days in each Term during the period of studentship, was deemed sufficient to support a claim to a call to the Bar. Meanwhile, owing to the growth of the Empire, and the necessity for filling a large number of legal or quasi-legal appointments in the Indian and Colonial Services, the need of soundly trained barristers became greater than ever. The beginnings of a revival of legal learning came with the Reform period in the "thirties." In 1833, the Inner Temple founded two lectureships; but the experiment was resented by students who had grown up under a laxer system, and was not firmly established until 1847, when the Middle Temple and Gray's Inn followed the example of the Inner Temple. Even then there was no compulsory test either for admission as a student to an Inn of Court, or for "call to the Bar" as a fully-fledged barrister.

Modern Education for the Bar. The introduction of the present efficient system of education for the Bar dates definitely from 1851, when the then

Solicitor-General, Sir Richard Bethell (afterwards Lord Westbury), summoned a general meeting of all the Benchers, which resulted in the establishment of the Council of Legal Education, consisting of representatives from the four Inns, charged with the establishment of a definite educational system. This body soon got to work; and, in 1855, when a highly important report on the Inns of Court was presented by a Royal Commission, it had a staff of Readers, who, in addition to their primary duties, conducted voluntary examinations, to which valuable studentships were annexed. Still, the only compulsory tests for call to the Bar were, even then, so far as education was concerned, a limited attendance at lectures, with the alternative of passing a voluntary examination.

The same Royal Commission, presided over by Sir William Page Wood, afterwards Lord Hatherley, made drastic proposals for the formation of a legal university, whose Senate, or governing body, should be constituted by representatives of the Benchers and barristers of the four Inns, and which should, in fact, be maintained and governed by the Inns. Though the separate existence of the Inns, and their disciplinary jurisdiction over their own students, were not to be interfered with, no one was to be admitted to an Inn of Court as a student unless he had complied with certain preliminary tests of general education; while no student was to be "called to the Bar" until he had passed the qualifying university examination.

The recommendations of the Royal Commission of 1855 have never been formally carried out; but the Council of Legal Education has gradually been expanded into something very like the legal university contemplated by the Report. For some time, the Preliminary Examination in general education remained little more than nominal; but quite recently the Consolidated Regulations of the Inns have required every person seeking admission as a student to have passed one of a fairly searching list of public examinations. The compulsory examination for call to the Bar was established in 1873, and is also of a substantial character. It is divided into two parts, the first of which may be passed at any time after the student's admission to his Inn, while the second cannot (without special leave) be attempted until after he has kept six Terms (*i.e.*, half the normal qualifying period of studentship). Attendance at lectures is not compulsory; but the qualifying examination is conducted by a Board of Examiners composed partly of the Readers and Assistant Readers, and is avowedly based on the subjects dealt with in the current year's lectures. Apart from lectures and examinations, the compulsory requirements of the Bar student's curriculum are limited to "keeping Terms" for three years by the not unpleasant process of dining in the Hall of his Inn twenty-four times in each year, or twelve times in the case of members of universities in the United Kingdom. Thus the ancient jest of "eating one's way to the Bar" has not entirely lost its point. Moreover, as before mentioned, the Bar has not adopted the principle of personal apprenticeship, or required any compulsory process of practical training for its members. But it is significant that the present regulations contain an express recommendation to the Bar student to "read in the Chambers of a Barrister or Pleader for the purpose of studying the practice of the Law"; though it is added that "such reading in Chambers is not compulsory." E. JENKS.

BASAL READING.—A name given in American schools to the earliest teaching of reading, in which the results are mechanical rather than intellectual. The reading books used at this stage are called "basal" or "foundation" readers.

BASEDOW, JOHANN BERNHARD (1723–1790).—Was born at Hamburg, and in 1753 became a master in an academy at Sorøe in Zealand, and, in 1760, at the gymnasium at Altona for a year. In 1762 appeared Rousseau's *Émile* (*q.v.*), a treatise on education, in which the writer advocated a departure from the artificiality of the age, and an education based on nature and reality as the best training for virtue and culture. Basedow became a believer in Rousseau's educational theory, and was also influenced by studying the writings of Comenius (*q.v.*). Following these guides and applying them to his own teaching, Basedow published, by subscription, his own opinions in his *Elementarwerk* (1774). This treatise was an illustrated school book intended for children, and endeavouring to teach them realities as distinct from mere words. To carry out his theories, he established a model school, known as Philanthropin, in Dessau, which was carried on for nearly twenty years, coming to an end in consequence of Basedow's own restlessness and quarrels with his colleagues. As an educational reformer, Basedow exerted considerable influence on public thought in Germany.

BASEDOW, BERNARD.—(See GERMAN INFLUENCE ON ENGLISH EDUCATION.)

BASEL UNIVERSITY.—This was established by Pope Pius II in 1460, but, later, became the chief representative of Reformation theology in Switzerland. Among the great names associated with it are Erasmus, who lived in or near Basel from 1522 to 1536, and the mathematicians Bernoulli and Euler. The faculties of the University are law, medicine, philosophy, and theology. There is a large library and about eight hundred students.

BASHFULNESS.—This arises from lack of confidence in oneself. It usually disappears through increase of knowledge of one's own powers and association with others. It is especially frequent among young children who are secluded from young companions. The best cure is a school life and encouragement by the teacher, but some cases last long past school age.

BASKET-WORK AS A HANDWORK OCCUPATION IN SCHOOLS.—It is not the object of this article to treat of basket-making as a process, but to consider it as an educational means which may be used in school.

When cane-work is taken in school, it is not so much with the object of teaching the children to make baskets or even to understand the principles underlying successful weaving in this material, as to afford them opportunities of thinking out for themselves the various problems they meet with in the process.

A Typical Problem. For instance, it is simple enough to give a rule-of-thumb direction for weaving on an uneven number of spokes, and another for weaving on an even number; the baskets will be quickly made, but the worker will have lost a great opportunity for mental activity, for experimenting with a real and pressing need in

view, which would have added to his general powers as an individual thinker and worker.

Probably the child is already familiar with the over-and-under stitch, as in darning and simple weaving; and, if the spokes are uneven in number, in his basket he will be able to deal with the new material according to past experience. It is best, of course, to plan so that the first attempt in this new material is on an uneven number of spokes. But, later, the basket may have a handle, and the problem of dividing the spaces equally along the rim will confront him, for, if that is not arranged, the handle will be crooked.

The need, then, for an even number of spokes quickly reveals itself, and accordingly the worker starts again, this time with an even number. But by the second or third round of the first weaver he realizes that all is not well. In his rug weaving it did not matter what number of threads he had in his weft; alternate ones were always worked rhythmically. But now he finds that his weaver goes over the same spoke and leaves unworked the neighbouring spoke at every round, and a new problem is at once presented. How can one weave on an *even* number of spokes? Is it possible? Has it been done? If so, how? At once an alert and investigating frame of mind is set up. One of two ways usually appears to help in solving the problem: (1) To experiment with a weaver and spokes, trying to find out a way for oneself; (2) to examine a basket with a handle and to follow the weaver round to see how the weaving is done.

Sometimes a judicious word checks blind-alley attempts from absorbing too much time, or a pertinent question sheds light on the problem. At any rate, the time taken by the worker in solving his own problem here is not wasted; he will show a greater power as he comes to later difficulties, going beyond the average rule-of-thumb worker.

An interesting comparison may be drawn between the last strand in the flat loom, where the weaver goes round both under and over as it finishes the top row and begins the underneath one, and the weaver in the basket, which embraces the spoke in starting, thus actually making a similar stitch of over-and-under in the two layers.

Other Problems. Other problems will necessarily arise in connection with the fastening of the ends of the spokes at the bottom, and by the top rim. Many delightful foot-ridges and rims can be "invented" by the children, though the actual patterns may often have been worked by others: "There is nothing new under the sun," yet to the worker the joy of finding out his own patterns ought not to be denied. Careful thought and a nice judgment are needed in considering the lengths of spokes, etc., both in starting the basket and as it progresses; and part of the fascination of this type of handwork is that constantly new conditions may arise to necessitate a new treatment.

Because the actual weaving with the cane is rhythmic, it is natural that the worker should hum or sing softly to himself as his hands guide the cane in-and-out; and some of the "craft songs" may be happily sung as the worker busies himself over his basket.

W. A. B.

(See also BASKET WORK, THE TEACHING OF; RAFFIA; TEXTILE WORK IN SCHOOLS.)

BASKET-WORK, THE TEACHING OF.—Basket-work, one of the earliest, if not the earliest, of arts

practised by mankind, may be roughly divided into three categories: (1) Osier or Willow-work; (2) Cane and Bamboo-work; (3) Raffia and other vegetable fibre work—the so-called Indian basket-work. In this and all Western countries, the first-named holds the highest place, since the material is indigenous, and traditional methods and designs are of paramount importance. It demands skill and a long apprenticeship, and is almost invariably practised by men organized in a trade union, who command remunerative wages which, before the war, varied from 30s. to 60s. a week, according to skill and aptitude.

Cane-work attains its highest development in the East; but whole cane and, more recently, pith, or manufactured, cane (*i.e.*, the centre of the cane from which the flinty epidermis has been stripped for chair bottoming) are increasingly used for cane furniture—chairs, couches, tables, etc.—and for side-cars; to some extent it is replacing willow in this country and on the Continent. Manufactured cane, by reason of its stringy nature and greater flexibility, demands less skill and training in the worker generally, and especially in cane furniture, where he has a rigid frame to work upon, and does not develop the form as the work proceeds, as is the case in willow-work, where every stroke has a permanent effect on the ultimate form, and where he is dealing with a stubborn material peculiarly liable to kink. For these reasons, and for the fact that less physical exertion is required for its manipulation, manufactured cane is admirably adapted for women's work and, in its simpler forms, for use in kindergarten schools. Moreover, as a material, it requires less careful preparatory treatment, by soaking in water for varying periods to render it pliable, than willow does.

Raffia, or Indian basket-work, as it is sometimes termed, is the earliest and most elementary form of the art; it is still practised by American-Indians and other primitive races all over the world, and consists of a core of grass or vegetable fibre, or a solid core of rush, cane, or willow, which is lapped round with a narrow strip or skein of similar material, coiled on itself in spiral or elongated coils, each coil being laced on the inner one as the work proceeds. This method is equally well adapted for women-workers, or for use in schools; and it also affords scope for simple and effective pattern decoration. Excellent manuals on the art of cane- and raffia-work have been published, but personal teaching and long practice are needed for the attainment of any degree of proficiency and of economic value in the work produced.

Willow. So far as willow and the higher forms of cane-work are concerned, workshop training is ideally the best; but, if technical training in classes is the only method available, the classes should be organized on the assumption that mastery of a difficult craft is the aim, and that adequate time and steady application must be demanded of the learner, whose final training should take place in a workshop. Above all, qualified teachers must be appointed who shall combine technical proficiency with capacity to teach. As a method of elementary training in manual skill, basket-making has a unique educational value, since in no other handicraft is the relation of the hand to the material so direct; in none other are the tools required so simple and so inexpensive. For the ordinary forms of round or oval work, they may be reduced to a knife and a bodkin (the latter term being used by

the professional worker in its Old English sense of a sharp piercing instrument). A pair of shears is useful, but by no means essential. For raffia-work, a needle will suffice. The practice of the art, therefore, will train the eye and hand of the pupil; it will develop his sense of form and his power to impress that form on a more or less recalcitrant material.

Basket-work for the Blind. Some misapprehension exists in the public mind as to the status of the blind basket-maker, and the economic value of his work, owing to the fact that so many of the baskets exposed for sale by institutes for the blind are ordinary commercial work, mostly imported from abroad and produced under normal trade conditions by valid workers. To enable the blind worker to earn a livelihood, his wages are, in practice, raised above the trade union level; and, although under these conditions he can be taught to make the commoner and coarser forms of baskets with varying success, qualified by the degree of blindness from which he suffers, the work always bears traces to the expert eye of the disability of the worker. The present writer, during a long experience, has known a few—very few—blind basket-makers who have succeeded in competing on equal terms with their more fortunate fellows, but such instances of superior aptitude are rare. T. O.

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BASUTOLAND, EDUCATION IN.—Basutoland has a population of 403,000 natives and 1,400 whites. The Basutos are an intelligent race and retain unbroken their organization under chiefs.

Though there are a few schools for European children in the various magisterial camps, the bulk of the schools are for native pupils. These schools are controlled by the Mission Societies, which receive Government grants. There are three principal Mission Societies working in the territory—

1. *The Paris Evangelical Mission Society*, which entered the country in 1833, and which is by far the largest mission. Headquarters: Morija.
2. *The Roman Catholic Mission*, which was established in 1864. Headquarters: Roma.
3. *The Mission of the Church of England*, the first permanent station of which was opened in 1876. Headquarters: Masite.

These three have established out-stations in almost every part of the territory. Owing to the difficulty of evangelizing an illiterate population, schools were founded as necessary adjuncts to the mission work. The education given was chiefly elementary and mostly in the native language; but out of these schools naturally grew institutions for the training of native teachers, evangelists, and artisans. A fixed sum (called the Block Grant) was annually contributed by the Government, roughly in proportion to the number of schools, to each mission. The schools were inspected by inspectors lent by Cape Colony and, in the intervals between their visits, by the Assistant Commissioners of the districts. Considerable inconvenience was felt under this system of the "Block Grant," as no provision could be made for new schools. Mr. E. B. Sargent visited the territory in 1905 and recommended that (1) the Block Grant system should be abolished; (2) a permanent inspector be appointed; (3) a syllabus, definitely drawn up for native requirements,

be formulated; and (4) a board of missionary representatives constituted to advise the Government. These recommendations have now been carried out. The Board of Advice on Education consists of three representatives of the P.E.M.S.: one representative of the Roman Catholic Mission, one of the Church of England, and one native representative of the paramount chief. The Government Secretary sits as chairman, and the Director of Education as vice-chairman. All questions of educational policy come before the Board, and the names and localities of all proposed new schools have to be submitted to it.

Grants are given to the missions (at the rate of 17s. per annum per unit of average attendance of pupils, calculated on the whole number in attendance in all schools and institutions of the mission), and from the total sum thus granted to each mission, a certain fixed amount is set apart for boarding schools and institutions. Out of the remainder of the total, grants are given for the payment of elementary school teachers' salaries; and the small balance finally remaining is spent in providing buildings and school material, or on other purposes approved by the Government.

Types of School. Elementary schools are divided into three classes, according to the number of pupils in attendance and the extent of the syllabus they cover. Third-class schools have an attendance of from twenty to forty-five pupils, and contain four classes. In these, the vernacular is almost entirely used. Second-class schools (45–70 pupils) teach up to Standard III; and in these, though the vernacular is largely used, some English is taught in the upper classes. First-class schools have an average attendance of over seventy pupils, and teach up to and including Standard VI. As to school syllabuses, it may be stated generally that a pupil leaving a third-class school should be able to read Sesuto fluently, and write it legibly and correctly, and be able to reckon small money sums. A pupil leaving a second-class school should have a sound knowledge of Sesuto, a working knowledge of English, and greater efficiency in arithmetic. A pupil completing the course of a first-class school is practically over the threshold of elementary education, for he is expected to understand the English of the ordinary Standard VI reading book.

Pupils leaving the elementary schools can go to boarding schools or institutions where they receive higher education (at Morija suitable pupils can be prepared for Cape matriculation) or be trained as teachers. The Cape pupil teachers' examination is usually taken. Others go to industrial schools, where they receive a training in special trades. The following list shows the number and character of these boarding schools—

Institution.	Mission.	No. of Pupils.	Character.
Morija	P.E.M.S.	158 boys	Normal and Higher Education
Th. Morena	"	50 girls	Normal and Industrial
Leloaeng	"	70 boys	Industrial
Masite	C. of E.	21 boys	Normal and Industrial
Maseru	"	18 girls	Industrial
Roma	R.C.	62 boys	Normal, Industrial, and Agricultural
Roma	"	234 girls	Industrial and General

There is also, at Maseru, a well-equipped industrial school for sixty boys maintained by the Government.

The following list shows the number of day schools in receipt of Government grants—

Mission.	No. of Schools.	Roll.	Average Attendance.
P.E.M.S. . .	232	17,882	13,070
C. of E. . .	35	2,490	1,762
R. C. . .	19	2,038	1,664
	286	22,410	16,496

Schools for Europeans are maintained or subsidized by the Government at Leribe, Teyateyaneng, Maseur, Mafeteng, and Mohale's Hoek. F. H. D.

BATHS, SCHOOL.—Baths are provided as part of the hygienic equipment of many modern schools, and serve also for physical exercise. The temperature of the water in a swimming bath is usually kept at a uniform level of about 70° Fahr., and this makes a bath too expensive for many schools. Additional expense is caused by necessarily frequent changes of water. Swimming baths are rarely provided for elementary schools, but in most large towns public swimming baths are regularly used for instruction. The chief disadvantage experienced by teachers who take classes to public swimming baths is that it is usually impossible to exclude the public when the class is present. Another purpose served by baths is to teach cleanliness. Higher schools, especially boarding schools, in most countries are, therefore, provided with one or more kinds of baths. The bath tub is often employed, but with an obvious disadvantage. In some German schools, zinc pans are used large enough to accommodate three pupils at once. Bathing is part of the school routine, and the pupils are able to bathe in relays twice a week. In other schools, the shower bath, at a temperature of 80° to 110° Fahr. is used. In one of the large co-education schools in Boston, ten shower baths are provided, and the children bathe weekly, an attendant keeping the temperature at 90° Fahr., while the individual bathers regulate the flow of water. The value of swimming and the use of school baths in teaching habits of cleanliness can hardly be over-estimated. In this country, perhaps, the art of swimming is the more considered, and life-saving by boys who have learnt swimming at school is frequent.

BATHS FOR SCHOLARS.—(See BUILDINGS, SCHOOL)

BATTERSEA POLYTECHNIC.—(See POLYTECHNICS, THE LONDON)

BATTERSEA (ST. JOHN'S) TRAINING COLLEGE.—Dr. Kay, afterwards Sir James Kay Shuttleworth, established a pauper school at Norwood, which he wished to be a model institution; and Mr. Wilson, its first headmaster, was he who, later, took charge of the National Society's Model School at Westminster, where about seventy masters and seventy mistresses were being trained. About the same time, Dr. Kay and Mr. Edward Tufnell founded a Normal School at Battersea (1840) for training teachers for pauper children under Dr. Kay's personal superintendence. The students included many youths selected from the Norwood School; they numbered about twenty-four, and their ages ranged from 15 to 42. The

Vicar of Battersea offered his village schools for the practical training of the students, and superintended the religious instruction. The young men appear to have been admitted on account of character rather than attainments, and the instruction included much gardening, household work, and gymnastics.

In 1842, the State made a grant of £1,000 towards the already incurred expenses, and in 1844 the College was permanently handed over to the National Society. The Rev. Thomas Jackson was the first Principal, and the College was then devoted chiefly to the preparation of teachers intended for manufacturing and mining districts. The numbers immediately rose to sixty-seven, and the ages ranged from the minimum of 16 to 29.

Until 1845, the College was open to many classes of students, and one year these included 9 clerks, 8 tradesmen, 5 shoemakers, 1 ship's captain, 5 farmers, 20 skilled workmen, and some pupil teachers; from 1846, however, only pupil teachers were admitted.

In 1847, Principal Jackson was succeeded by Samuel Clarke, a great student and educator. The chapel was built in 1858. Canon Graves was Principal from 1863 to 1866, with Evan Daniel as Vice-Principal. Evan Daniel became Principal, in 1866, at the early age of 29, and directed the College till 1894, when he became Vicar of Horsham. Under Canon Evan Daniel, the reputation of the College rapidly increased, and hundreds of present-day teachers look back with gratitude and pleasure to their association with him. In 1869, he enrolled the students in the 2nd Middlesex Volunteer Regiment, under the late Lord Ranlagh.

The new wing known as Cyprus was added in 1878.

Canon Daniel's policy in regard to staff was to take promising students at the end of their training, and for many years his whole staff was thus constituted. Under his successor (Canon Wesley Dennis), many structural alterations were made. University courses, also, have been introduced, and university men appointed lecturers. Seven Battersea men have become principals of training colleges in England and three abroad, over forty have joined the Inspectorate. Mr Ernest Gray, M.P.; Sir John Eliot, K.C.I.E., Director-General of Indian Observatories; Dr Morris, the great philologist; George Manville Fenn, the writer of children's popular books; and G. J. Snelus, F.R.S., the distinguished metallurgist, are eminent old students.

BAXTER, RICHARD (1615–1691).—A native of Shropshire, who was educated chiefly at the free school at Wroxeter. He entered the Church at twenty-one, and turned to Nonconformity as a result of Laud's government of the Church. He was a chaplain in the Parliamentary Army, but was unpopular for his opposition to the prevailing opinions and his support of the monarchy. In 1650 he wrote *The Saints' Everlasting Rest*. He was one of the two thousand clergy expelled from their livings under the Act of Uniformity, and in 1685 was tried and imprisoned by Judge Jeffries for "seditious libel" in his *Paraphrase of the New Testament*. After eighteen months in prison, he wrote many theological works and an autobiography.

BAXTER, RICHARD.—(See TILLOTSON, ARCH-BISHOP.)

BEALE, DOROTHEA.—Born in 1831, Dorothea Beale participated in the great movement, in the reign of Queen Victoria, for the education of women. Her contribution thereto resides not in writings, but in deeds. There is singularly little published matter if one regards the years of her activity in Cheltenham (1858–1906); but, as Principal of the College which some would fain see called by her name, the atmosphere and the leisure was wanting for contributions to the science and philosophy of education in other form than that of brief addresses. Of the need for such contributions, she spoke in the Preface she wrote for Miss Mulliner's translation of Herbart's *Application of Psychology to the Science of Education*. She says: "The tide against which many of us have been rowing has at last turned; the old empiricism, which declared there was no such thing as a science and philosophy of education, speaks no longer with so loud a voice: the demand for thoughtful works is increasing and will increase." In the same context she also says: "We want, not translators only, but English psychologists and philosophers to naturalize the best thoughts of educational thinkers of the world; translate them, not into our language only, but into our forms of thought; adapt them to our environment. . . . Not until we have chairs such as those occupied by Kant and Herbart, Rosencranz, Fichte, and Lotze, can we hope that men with such powers of thought will be able to find the leisure and intellectual surroundings which will make it possible for them to accomplish this work for us."

Life a Privilege. Life to Miss Beale was a privilege, an opportunity of immeasurable value. To her, with her Christian faith, it was, indeed, the preparation for a fuller and more perfect existence; but no one who knew her could fail to be impressed by her enjoyment and appreciation of this human stage. Books were an unfailing delight, the sweet scents and sights of the early morning a daily source of refreshment, and her work, particularly as embodied in the College, an absorbing interest. It was the idleness, the frivolity, the unrest of the women of her age that provoked thoughtfulness. As she said, when summoned to give evidence in 1866 before the Commissioners appointed to enquire into the state of girls' education: "You cannot say to the human mind that it shall absolutely rest . . . if girls have not wholesome, proper, and unexciting occupation, they will waste their time on sensational novels and things much more injurious to their health." Another witness before the Commission said of the women of the day: "I think their want of discipline makes them restless and unreasonable, and their waste of time is a loss to themselves and those around them. . . it is the want of the habit of employment, and the want of serious tastes which makes them frivolous and dependent on excitement for passing their time."

Value of Work. The circumstances of the poor, as Miss Beale remarked in a paper read at the Social Science Congress, October, 1865, "afford an education which gives earnestness, strength, reality." It was the daughters of the so-called higher classes who needed to be taught to value work. Their parents, too, needed to be taught to value thoroughness. In the Ladies' College at Cheltenham, Miss Beale laboured for forty-eight years to bring these truths home to both. The measure of her success cannot be known until the secrets of men's hearts are revealed, but the record of her pupils whose work has come to the light is no inglorious one.

It was work in many guises to which Miss Beale urged her girls. There was the call of the home, with its somewhat desultory duties, for many of the class from which her pupils were drawn. For these, she advised some course of self-improvement, and fostered it by the regulations for membership of the College Guild. In the medical world, in the mission field—indeed, in spheres too numerous to mention—women inspired by her are to be found. On those blessed by wealth, who took up paid work, she enjoined the duty of demanding adequate remuneration for their work, lest they should undersell their less fortunate sisters. She would point out very plainly her own conviction of the duty incumbent upon them to use the income thus gained in excess of their needs for the education or nurture of others who lack opportunities in life. The idea that to inspire a woman to work in other fields was to cut her off from marriage or divert her from womanliness, was not one which she would have admitted. She held that faithful service in any field of work is the right preparation for the highest calling for woman—motherhood.

Her Ideal. It is natural that she should have expressed herself more fully and richly on the work of teaching. Of the ideal which she set before teachers, one might well say in the words of Milton: "This is not a bow for every man to shoot in, but will require sinews almost equal to those which Homer gave Ulysses." It is a life of devotion. "Ours is a service sufficient to engage our whole powers, and within the work we shall find all the interest, all the recreation, all the variety we need. We must be single-minded in desiring, above all, to do our work well. To win honours or money directly or indirectly must come in only so far as these are consistent with the true purpose of our life." The body is the instrument of the mind; its health and vigour, then, should be the object of care. Means thereto are healthy recreation, sufficient sleep, wisdom in dress, temperance in all enjoyments—even "delight in work"—and the use of holidays as holy days consecrated to the renewing of bodily, mental, and spiritual strength. In the mental sphere, there should be economy of time, constant progress in the paths of knowledge, and consistent exercise of thought. But, above all, "only as we behold the Face of the Father, can we teach."

K. L. J.

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RAIKES, E. *Dorothea Beale of Cheltenham.*

BEC.—The famous abbey of which Lanfranc and Anselm were, in succession, abbots. It was the most famous Norman ecclesiastical school, and Anselm one of its most famous scholars. The abbey ruins are still visible at the village of Le Bec (dep. Eure), near Rouen.

BECHUANALAND, EDUCATION IN.—The Bechuanaland Protectorate has a population of about 125,000 natives and 1,700 Europeans. The natives live chiefly in large stadts, or villages, the headquarters of their chiefs, who still retain considerable power. In the spring, most of the natives leave home and trek to the plough-lands, where

they remain till the harvest is gathered. This custom influences the schools considerably: at one time the attendance falls to fifty or sixty, at another it rises to two or three hundred. Education, therefore, can barely advance beyond the elementary stage, and that chiefly in the native language.

The schools are controlled by missions, and receive a grant from the Protectorate Government. In the Southern Protectorate, a voluntary tax up to 4s. per head is contributed by the natives for education, and the chief of the district and the magistrate sit in committee with the local missionary representatives to supervise expenditure. The bulk of the schools belong to the London Missionary Society. There is no institution for higher education actually in the Protectorate, but the London Mission has a normal and technical school at Tiger Kloof near Vryburg, to which pupils can proceed. At each considerable stadt there is a resident missionary, who supervises the local school and also often five or six small out-station schools, some many days' journey from the central station.

LIST OF SCHOOLS (EXCLUSIVE OF OUT-STATION SCHOOLS).

School.	No. of Pupils.	Mission Society.	Chief.	Tribe.
1 Serowe ..	214	L.M.S.	Khama	Bamangwato
2 Serowe (Khama's)	210			
3 Kanye ..	381		Gaseitsiwe	Bangwaketse
4 Molepolole	174		Sechele	Bakwena
5 ..	91	C of E.		
6 Mochudi ..	253	Dutch Reformed	Lenchwe	Bakhatla
7 Ramoutsa ..	158	Hermannsburg	Baitlotle	Bamaletse

There are schools for Europeans, subsidized by the Government, at Francistown, Serowe, Magalapye, Lobatsi, Hilda Vale, and Pitsani. F. H. D

BECON, THOMAS (1512-1567).—One of the Protestant reformers, who wrote incidentally on educational matters in his *New Catechism sette forth dialoge-wise in familiar talks between the father and the son* (c. 1550). He abjured his opinions at St. Paul's Cross in 1543, and retired to the Peak, in Derbyshire, to take pupils. In 1547 he became rector of St. Stephen's, Walbrook, London. He withdrew to Strasburg in Mary's reign and returned in Elizabeth's reign; and became rector of Christ Church, Newgate Street, London. In the *New Catechism* is a section on "the importance and nature of the good schoolmaster." He insists on the bringing up of children in Christian doctrine, and the use of the Bible for this purpose. He allows all liberal sciences to be used, and the teaching of poets, orators, historiographers, philosophers as "handmaids," but not as "mates" with God's Word. There must be a restriction of classical works, to include only those which are pure and innocent. He allows older women to teach, and is apparently the first English writer to advocate public schools for girls. The woman is as dear to God as the man. Children are ordinarily such as the mothers are. Becon advocates girls' schools, with godly matrons as teachers; and praises any founders of such equally with the founders of boys' schools. F. W.

BEDE.—Born in 673; went, when 7 years old, to St. Peter's Monastery at Wearmouth, and a few

years later to Jarrow Monastery. His Latin treatise, *The Nature of Things*, was an encyclopaedic volume of knowledge gathered from the many books he had studied in the monasteries. Bede spent many years in writing his *Ecclesiastical History of England*, which he finished in 731. His facts were derived from traditions and writings collected from Roman, British, Scottish, and Saxon sources, and the book provides the most reliable source of early British history. It was written in Latin, but afterwards translated by King Alfred. After finishing his history, Bede lived four years, and during a painful illness he translated into English the Gospel of St. John. The pupil who wrote the translation for him relates that Bede died almost immediately after the last sentence was written; and all the information given about Bede by the Anglo-Saxon Chronicle is the brief notice: "A.D. 734. This year . . . Bede departed this life."

BEDE COLLEGE, DURHAM.—(See DURHAM, BEDE COLLEGE.)

BEDFORD COLLEGE FOR WOMEN.—Bedford College is the oldest University College for Women, having been founded, in 1849, with the intention of offering to women the opportunity of a "Liberal Education in the higher branches of study in various Departments."

Foundation and Constitution. Mrs. Elizabeth Reid, aided by a number of friends who acted as Lady Visitors to the classes, was the real foundress of the College, giving large donations to start it.

At the foundation, in 1849, the College was managed as a private enterprise by the various ladies and gentlemen who formed the Board—probably the first Educational Board on which women were members; but, after twenty years, in 1869, it was incorporated as a "Company not trading for profits" under the Companies Act, when the name of "Bedford College" was first actually adopted. The management was vested in a Council, of whom at least one-third had to be women. In 1908 a Royal Charter was obtained, which maintained the same proportion of women, and arranged for representatives of the teaching staff and former students to serve on the Council. Representative Councillors are also nominated by the University of London, the London County Council, and other public bodies. Since 1869, when the office was instituted, the following have been the Visitors of the College: Erasmus A. Darwin; Rev. Mark Pattison, Rector of Lincoln College, Oxford; Miss Anna Swanwick; Professor N. Story Maskelyne; Lord Herschell; Dr. R. C. Jebb; and Viscount Haldane of Cloan.

The Patronesses of the College are: Her Majesty Queen Mary and Her Majesty Queen Alexandra.

Building. The College was opened at 48 Bedford Square, and, in 1861, a second house was added. From that time, the College has provided for some resident students, though it consists mainly of day students. In 1874, the College was moved to York Place, Baker Street, where the leases of two houses were purchased, which were enlarged and adapted to the purposes of the College, and for the first time two laboratories were built for women's use. In 1890-91, a wing was added facing into East Street, when two more laboratories were built, with lecture-rooms for Chemistry and Physics. In 1896, No. 10 York Place was rented, which provided a

fifth science laboratory and increased library accommodation; in 1903, pending the removal of the College, No. 7 York Place was taken. In 1902, it was apparent the College must be moved into larger premises; but a suitable site was not found till 1908, when the remainder of the lease of South Villa, Regent's Park, was purchased, and the new buildings were begun in August, 1911, and opened by Her Majesty Queen Mary on 4th July, 1913. The present building consists of an Arts and Administration Block, with two large wings accommodating seven distinct laboratories; a Residence Block, with dining hall and Principal's rooms; and a library given by Lady Tate, with a Wernher Reading Room adjoining. The total cost of the building was £130,000, mainly raised by private donations.

Development of the College Work. During the first few sessions, classes were formed in fifteen different Arts subjects, under lecturers like Augustus De Morgan, Francis W. Newman, W. Sterndale Bennett, Alexander Bain, M. Ragon, Dr. Heilmann; while Dr. William B. Carpenter gave lectures in Natural Science, but without any practical work for the students.

In 1856, an attempt was made to create something like a University standard by instituting "College Courses." In these, Latin and Mathematics were compulsory, and three, four, or five classes in any of the following subjects might be added: English, French, German, Italian, (Greek was added in 1860), History (Ancient and Modern), Harmony and Vocal Music, Geography, Mental and Moral Science, Political Economy, Drawing, and Natural Science.

In 1860, the first practical science classes for women were instituted under the name of "Natural Philosophy," with experiments carried out in the lecture room. The first laboratory for women was for Botany in 1872; others followed for Chemistry and Physics in 1876, Zoology in 1879, Physiology in 1882, and Geology in 1885. Lectures on Experimental Psychology were started in 1902, practical work followed in 1905, and a specially equipped laboratory was added in 1913.

The development of the College was assisted by the opening, between 1869 and 1897, of various public examinations to women, amongst which were those for Degrees at the University of London. The Council immediately determined that this was the opportunity for the College to fulfil its function of a Women's University College. Provision was, therefore, made for the needs of students preparing for Degrees in Arts and Science, but, having no endowments, the financial position of the College was very difficult, as so few women were qualified to enter for Degrees during the first ten years or more after their first admission.

In 1892, a Training Department for Secondary Teachers was established, and is now recognized by the Board of Education, the University of London, and the Cambridge Syndicate. In 1893, the first Educational Head (Miss E. Penrose) was appointed as Principal of the College. She was succeeded by Miss E. Hurlbatt and Miss M. J. Tuke, M.A. In 1894, the Treasury gave a first Parliamentary grant to it as one of the University Colleges, which has been three times increased. Since 1905, special Parliamentary grants have been given for the equipment of the library and laboratories, and towards a pension scheme for the benefit of the staff. In 1894, also, the Technical Board

gave a grant, which has been continued by the London County Council. In 1895, a Scientific Hygiene Course was arranged, which is now recognized by the Conjoint Board of the Royal College of Surgeons, the Royal College of Physicians, and by the Sanitary Inspectors Joint Examinations' Board. This is now merged into a course to prepare women for social work.

Under the University of London Act, the College was recognized as a School of the University in the Faculties of Arts and Science in 1900. Matriculated Students are registered as Internal Students, and the College is recognized for Preliminary Medical Studies and for advanced Medical Studies in Chemistry and Physiology. For Honours and Post-graduate work, the College co-operates with other Colleges of the University in a scheme of inter-collegiate lectures.

There are now twenty-two heads of departments, of whom six are university professors and eleven university readers; twenty-one assistant lecturers and assistants and ten demonstrators.

Fellowship, Scholarships, and Endowment. In 1852, Mrs. Reid founded the first scholarships ever offered to women; and on her death, in 1866, she left a large portion of her property in the hands of trustees for the promotion of female education, which is mainly used in granting scholarships to be held at Bedford College. In 1893, the trustees founded from this fund a Reid Fellowship—annual value, £50 for two years—the first fellowship offered to women; and now they have instituted a Notcutt Travelling Scholarship of the value of £100 a year. Besides the above scholarships, Miss Clift, Mr. S. Courtauld, Mrs. Arnott, Sir Henry Tate, and Amy Lady Tate have left money for scholarships; the Pfeiffer Trustees granted money to found two more; two Millicent Fawcett Scholarships have been founded; and Lady Huggins has given one in Sociology. There are, therefore, six scholarships in Arts and six in Science granted by the Council; and numerous others, offered by the London and other County Councils, are held at Bedford College. As soon as Bedford College had been moved into Regent's Park, an Endowment Fund was started, which received the munificent gift from Sir Hildred Carlile of £105,000, given in memory of his mother; and also a donation of £5,000 from the Goldsmiths' Company, besides smaller gifts. Efforts are now being made to enlarge the College and the Endowment Fund, as the number of students is greatly increased since the war.

H. BUSK.

BEDFORD GRAMMAR SCHOOL.—One of the sixteen grammar schools licensed by Edward VI in 1552, Bedford Grammar School probably existed, in some form or other, more or less continuously from pre-Conquest days. In 1566, Sir William Harpur, Merchant Taylor, Sheriff, and Lord Mayor of London, endowed the town of Bedford with 13 acres of land in Holborn, at that time producing a rental of about £150. The property is now of enormous value, and maintains, besides the Grammar School, almshouses, schools for girls, and the Modern School. The Grammar School was transferred to splendid new buildings in 1892. There are eight small boarding-houses under the charge of masters; boys are admitted into the school from the age of seven, the preparatory department, containing about one hundred boys, being housed in a separate building and having a separate

play-ground and a special portion of the playing-field allotted to it. The school being so splendidly endowed, the fees are low, and the equipment is magnificent. There is a remarkably efficient technical and engineering department, which also provides training for Colonial life. The main trunk of the curriculum is classical, but, besides a civil and military side, there are special classes for business. Bedford sends large numbers of her 800 boys into the public service, especially the Army and Navy, and the Indian Civil Service: Woods and Forests, and Police. She is usually well represented, too, at the universities.

BEGGING STUDENTS.—In the Middle Ages, the practice of wandering about the country, both in England and on the Continent, was common among priests, friars, and scholars. These were all supported by gifts of food and money, usually as a response to begging. The universities of the period contained many students who had begged their way from their homes to the *domus pauperum* provided for those without means, while the University authority gave official sanction to street-begging.

BEHAVIOUR.—The term "behaviour" is sometimes used in a wide sense to cover all purposive activity (*e.g.*, McDougall: *Social Psychology*, 1914, pp. 353 ff.; and W. James: *Talks to Teachers*, p. 28). It will, however, be here confined to its narrower and more usual meaning of the individual's response to his social environment as expressed in his bodily movements. The presence and actions of other people, who form this environment, with the thoughts and feelings we attribute to them, evoke in us corresponding modes of behaviour. Behaviour may be mainly automatic, as when we imitate the movements of others without any consciousness of an end to be achieved. In the same way, we tend to think as others think, if there is no reason to the contrary. In early childhood, behaviour is largely determined in this way; but the same process continues in later life, and is one of the chief methods by which traditions of behaviour are established and maintained. The importance of automatic behaviour as a stable element in our mental life explains the great influence of school customs and routine. A somewhat higher type of behaviour is that due to impulse. Here behaviour is chiefly determined by the perception of the behaviour of others who are felt to be persons like ourselves, and who arouse some emotion in us. The baby hugs its mother or hits her with its fist. Impulsive behaviour is susceptible of social endorsement or control, but it is important that it should not be too suddenly or forcibly repressed. The child's attention should be distracted, or the impulse led to vent itself in some more desirable activity. (The importance of this has been shown by Freud and his collaborators, see *e.g.*, Hart: *Psychology of Insanity*.) Impulsive behaviour merges into behaviour determined by conscious purpose (*e.g.*, a boy's behaviour may be the result of his desire for popularity or for the welfare of the school). The interests which may thus control behaviour are of very varying value. At school, the boy's personal interests should be widened by his interests in the common good, shared by himself with others and embodied in the school institutions. His behaviour will then be guided neither by selfish motives nor by unwilling obedience, but by his acceptance of the school's

authority as necessary for the ordering of the common life. Such social control of behaviour is a condition of the boy's growth in freedom, and, though such growth involves some conflict between the individual and society, this conflict ought not to disturb the fundamental harmony of interests. In its highest form, behaviour becomes conduct inspired by devotion to ideal ends, but these ends will be shaped by social conditions, and behaviour will continue to be determined partly by the same influences as those which moulded it in its earlier stages. H. BOMPAS SMITH.

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BEIT FOUNDATION, THE.—(See COLONIAL HISTORY, TEACHING OF.)

BEJANS OR BEJANTS.—(See STUDENT LIFE, THE HISTORY OF.)

BELFAST, THE QUEEN'S UNIVERSITY OF.—In 1849, Sir Robert Peel established and endowed university colleges at Belfast, Cork, and Galway, calling them Queen's Colleges. They were equipped with faculties of arts, law, medicine, and engineering; and in the following year the Queen's University of Ireland was founded as a central examining and degree-granting institution, to which they were affiliated. With a view to making the scheme acceptable to Catholics and Protestants alike, the colleges were set free from all religious tests; but this emancipation was looked upon by the former as secularization, and the success of the new university was much impaired by their refusal to take part in it. In 1879, Lord Beaconsfield dissolved it and set up the Royal University of Ireland in its place. The Royal University was a mere examining body, which conferred its degrees on all comers, no matter what their place or manner of education might be; the three Queen's Colleges were still constituent parts of the university, but, except in regard to the faculty of medicine, they lost some of their importance. The change was, however, beneficial to the Catholic University of Dublin, whose students were now able to obtain degrees, an advantage of which they had up to that time been deprived in consequence of the refusal of the Government to grant a charter to their *alma mater*; the university was reorganized and expanded, and several new Catholic colleges were founded. The Queen's Colleges were viewed with some degree of jealousy by the new unchartered Catholic University of Ireland, inasmuch as they were subsidized by the Government; and agitation for equality of treatment resulted in Mr. Birrell's Irish Universities Act of 1908, whereby the Royal University was abolished, and two new ones took its place: one, the National University of Ireland, comprising the colleges at Galway and Cork, together with University College, Dublin (formerly the Catholic University); the other having its seat in Queen's College, Belfast, henceforth to be called the Queen's University of Belfast. Both these institutions are handsomely endowed. Belfast University has an annual Government grant of £18,000, and was given £60,000 for foundation expenses. It was constituted in 1909, and contains the four faculties of arts, science, law, and medicine.

the last being the largest. The first Chancellor was the Earl of Shaftesbury, who was Lord Mayor of Belfast in 1907.

BELFAST, QUEEN'S COLLEGE.—(See IRELAND, THE NATIONAL UNIVERSITY OF.)

BELGIUM, DOMESTIC, TECHNICAL, AND COMMERCIAL EDUCATION IN.—The professional tendency, which is a feature of elementary education, is even more conspicuous in the numerous technical, commercial, and domestic schools recently founded by the *communes*, or privately by trade societies and individual manufacturers or merchants. They may earn Government grants, but, if so, they are liable to inspection by the Ministry of Industry and Labour.

Domestic Education for Girls. 1. DOMESTIC SCHOOLS AND CLASSES of practical instruction in household management, especially intended for working-class girls. There is usually a year's work in (a) housekeeping and the care of furniture; (b) washing, starching, and ironing; (c) cutting, making, and mending; (d) cookery; and (e) in rural districts, gardening and poultry-keeping. A few theoretical lessons are given in hygiene, domestic economy, and the care of infants and invalids.

2. PROFESSIONAL DOMESTIC SCHOOLS. The theoretical lessons are usually in the morning, and the professional lessons in the afternoon. The complete course occupies three years. These schools are popular with the middle classes, and are growing more and more numerous. The subjects of instruction are: (a) Drawing from the professional point of view; (b) sewing and dressmaking; (c) millinery; (d) artificial flower-making; (e) embroidery; (f) painting on porcelain; (g) commercial book-keeping, typewriting, and shorthand; and (h) domestic economy.

Technical Education. Trade instruction is the more urgent as apprenticeship is now almost extinct. But the Government does not itself organize this branch of education. It leaves promoters a free choice of methods, and limits its own action to general direction and control of grants.

There are schools of machinery and mechanism; schools for iron and wood work; schools of plumbing, clockmaking, carving, goldsmiths' work, gun-making, bookbinding and gilding, painting, spinning, weaving and dyeing, tanning and basket-making; schools for tailors, carpenters and printers.

Among apprenticeship workshops properly so-called are twenty-four organized where granite-quarrying is carried on; and thirty-five in Flanders, intended to keep weaving up to the level of modern industrial progress. The Schools of St. Luke, conducted by the Christian Brothers at Ghent, Schaerbeek, Tournai, Liège, and Molenbeck St. Jean, are devoted to the building trades; construction, decoration, and furnishing. Architectural drawing, wood and stone carving, artistic ironwork, decorative painting, painting on glass, and design in relation to jewellery, embroidery, bookbinding and printing are taught.

INDUSTRIAL SCHOOLS are distinguished from professional schools, with which they are often confused, by the fact that they are entirely devoted to the theoretical teaching of the arts underlying manufactures; whereas the latter are nothing but workshops in which manual dexterity is cultivated

and developed. They give the artisan the theoretical instruction which he is unable to acquire in the workshop, develop his general knowledge, and enable him to play a more intelligent part in the work of economic production.

Very considerable improvement is noticeable in agricultural instruction. Official institutions include a practical intermediate school of agriculture at Huy, two intermediate schools of horticulture and arboriculture at Ghent and Vilvorde, and a higher agricultural institute at Gembloux, which confers the diploma of agricultural engineer. The course lasts three years; a fourth year, which is optional, gives preparation for special certificates in forestry, the management of estates, and industrial agriculture. The State School of Veterinary Medicine at Cureghem is the only veterinary school in the kingdom. There are also numerous "free" schools, which receive official grants, and help to develop all grades of agricultural knowledge and practice. Among the most notable are the School of Agriculture of the Christian Brothers at Carlsbourg, the Agricultural Institute of La Louvière, and the Agronomic Institute at the University of Louvain. Public lectures given by agricultural experts employed by the Government are prevalent, and have brought the technical education of the farmer to a high level. Thanks to them, chemical manures were introduced, rational feeding of cattle was popularized, and machinery was appreciated at its proper value. The farmers seized on the advantages of the new methods, and joined societies dealing with loans, deposits and insurance recommended at the lectures.

Commercial Education. Commercial schools provide instruction for the management of business houses, workshops, and manufactories. The Higher Institute of Commerce at Antwerp, founded in 1852, was long the only institution of its kind; economic expansion made it necessary to multiply such schools: to-day, commercial education has actually obtained a foothold in the universities, by the addition of special schools of commerce to the faculties of law. The first two years are preparatory to the degree of *Licencié en Sciences Commerciales*; the third leads to special diplomas in connection with consular, colonial, and financial matters. Modern languages, commercial geography, civil and commercial law, political economy, statistics and commercial history are of first importance. Particular attention is paid to business routine, commercial composition, book-keeping, arithmetic and accountancy. There are special courses in Belgian and comparative constitutional law, public international law, consular legislation, marine commercial law, financial science, colonial legislation, colonial agriculture, and tropical diseases and hygiene. Numerous foreign students come every year to take the courses. Several other large higher schools are more specialized: the Higher School of Textiles at Verviers; numerous schools of brewing; the School of Mines and the Polytechnic of the Province of Hanaut, and the School of Arts and trades, Pierun lez-Virton (established in 1901).

All subsidized schools are inspected yearly. Grants are fixed according to the following principles: (a) Where the instruction is purely theoretical, the grant is one-third of the approved expenditure; (b) in professional schools (that is, schools of manual instruction) the grant is two-fifths of the approved expenditure.

The State also undertakes to pay half the foundation expenses of equipment, and half the cost of collections and models.

Art Education. There are eighty-four academies and schools of art, with a total attendance of 16,113 students.

The most important is the Royal Academy of Fine Arts at Antwerp. In 1885 it received its present organization, and is still the only academy which depends on the Government. It consists of two sections: the Higher Institute of Fine Arts, which is, in a manner of speaking, an art university; and the Academy proper, in which intermediate and lower instruction is given. The Higher Institute contains studios of painting, sculpture, architecture, and engraving on copper and wood, each directed by a principal. There are also classes in design; and lectures on the history of art, pictorial perspective, French and Flemish literature and practical construction.

In the lower section, drawing in all its stages, painting, sculpture and architecture are taught according to the intermediate and lower syllabus established in 1885.

Musical Education. Besides the Royal Conservatoires at Brussels, Liège, Ghent, and Antwerp, there are fifty-nine schools of music, which receive Government grants and are under the control of the Inspectors of Musical Education and of the Advisory Council for Musical Education (which was founded by a royal decree on 27th January, 1881). They were attended by 20,545 students.

Military Education. 1. REGIMENTAL SCHOOLS. Pupils are recruited from among soldiers who, by character and intelligence, seem likely to make good non-commissioned or warrant officers.

2. A SCHOOL OF CADETS at Namur provides secondary and military education for the sons of officers on the active list intended for the career of officer or army doctor, pharmacist, or veterinary surgeon.

3. THE MILITARY SCHOOL at Brussels trains officers for the four arms of the service—infantry, cavalry, artillery, and engineers. Admission is gained by competition, open to soldiers as well as civilians.

4. THE SCHOOL OF WAR provides higher military instruction and secures a supply of officers for the Staff Corps. C. DEJACE.

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BELGIUM, THE EDUCATIONAL SYSTEM OF.

—Article 17 of the Belgian Constitution declares: "Anyone is free to undertake the work of instruction; no measure to hinder this is permissible; the repression of irregularities belongs solely to the law.

"Public instruction subsidized by the State is to be regulated by law."

It follows that any private person, Belgian or foreigner, or any society, can open educational establishments of any kind whatsoever, without any authorization, without any conditions as to competence or good character, and without any sort of special supervision. If abuses creep into the exercise of this liberty, it is for the authorities

to take proceedings and put them down. Under the aegis of these liberal arrangements, a considerable number of educational establishments have been founded, ranging from the modest village school to the colleges of the towns and the great free universities of Louvain and Brussels. The instruction given in these schools, of all grades and all kinds, is called *enseignement libre*; that given at the expense of the public authorities bears the name *enseignement public* or *officiel*, and is regulated by law.

Education is *elementary*, *intermediate*, and *higher*.

Elementary Education. Elementary instruction, the hinge about which the education of the people revolves, is so important, that in many countries it is compulsory. The law of 1914 established compulsory, gratuitous instruction. School-life was lengthened by two years, attendance being extended to the age of 14. Certain rules were framed which placed private instruction on a footing of comparative equality with official. Elementary education comprises *écoles gardiennes* (kindergarten schools), *elementary schools* properly so-called, and *adult schools*. All three are directed by the *communes*; there must be at least one elementary school in each *commune*; but neither the kindergarten nor the adult school is compulsory.

KINDERGARTEN SCHOOLS receive children from 3 to 6; they are mixed, and the teachers are women. The syllabus includes physical exercises and games; exercises in thought, language, and recitation; songs learned by ear; and manual occupations. Building with sticks, strips, cubes, etc., and exercises in modelling, folding, plaiting, weaving, etc., give manual dexterity and a nodding acquaintance with certain shapes of great use later in the elementary school.

ELEMENTARY SCHOOLS. Elementary education begins at 6, and is supposed to continue to 14. Schools may be either *communal* (i.e., established and directed by the *communes*) or "free" (i.e., private schools which, fulfilling the conditions and accepting the regulations imposed by the law, are admitted by the State to a share in the division of its grants, on a footing of equality with the communal schools). The minimum syllabus comprises religion and morals; reading, writing, and elementary arithmetic, including the metric system of weights and measures; the elements of French, of Flemish, or of German, according to local requirements; geography; the history of Belgium; elementary drawing; the rudiments of hygiene; singing; and gymnastics. It includes, further, for girls, needlework; and, in the rural *communes*, for boys, elementary agriculture.

As regards religious teaching, there have been unceasing angry struggles between the two great political parties of Belgium: the Catholics and the Liberals. Under the law of 1842, religious instruction was obligatory, and was placed under the control of an ecclesiastical inspectorate. The law of 1879 (the work of the Liberal Cabinet) removed religious instruction from the syllabus, but granted the clergy facilities for giving that instruction out of school hours. On their return to power, the Catholic party did not at once make religious knowledge obligatory, the law of 1884, in fact, allowing the *communes* freedom to provide for it or not, as they chose, at the beginning or end of school hours. The law of 1895 made it again obligatory, but allowed parents, who objected, to withdraw their children.

The *communes* possessed the right of adding to the syllabus practical, useful, optional subjects, such as natural science, constitutional law and social economy, geometry, book-keeping, etc., etc. There were even some that had added to the three cycles of two years each a fourth supplementary grade, thus initiating a system of higher elementary instruction. Taking account of this progressive movement, the Government, by the law of 1914, prolonged school attendance generally by two years, in which instruction, which is preparatory to professional education and varies according to the needs of each part of the country, is to be provided.

ADULT SCHOOLS are intended principally for working men who desire to continue their education. Instruction is given chiefly in the evening, and comprises (a) an elementary course intended for young people who have received primary education not at all, or incompletely (reading, writing, elements of the native language, elements of arithmetic, and the metric system); or (b) a course of revision and improvement (the syllabus of elementary instruction, but with more advanced drawing applied to arts and crafts); or (c) special courses in natural science, agriculture, practical geometry, language lessons, domestic economy, and book-keeping. Adult schools have not been very successful; now that education is compulsory and school attendance longer by two years, their *raison d'être* will probably diminish still further.

To provide male teachers, there are 26 training colleges: 7 State-provided and 19 approved. Women's training colleges number 46, of which 6 are State-provided and 40 approved.

The direction of elementary education is attached to the Ministry of Science and Art, at Brussels, and is assisted by an advisory council and inspectorate.

The advisory council settle questions submitted to them by the Ministry, and adopt or reject educational manuals, prize books, and equipment. There are 18 chief inspectors and 92 district inspectors, and their work also covers kindergarten schools and adult classes. They report to the Government and control the application of grants.

According to the most recent statistics (23^e *Rapport Triennal*, 1909-11), the total annual expenditure on elementary education amounted to 58,755,471 ft. The number of kindergartens was 3,186, with 275,911 children on the books; there were 7,590 schools, with 934,830 scholars; and the evening continuation schools numbered 4,940 and contained 246,292 students. The State-budget for the year 1920 foresees a sum of 111,208,165 fr. for elementary education, which sum comprises 100,000,000 fr. for the payment of the salary of kindergarten and elementary school teachers.

Intermediate Education. A distinction is drawn between instruction of the lower grade, given in *écoles moyennes*, and instruction of the higher grade, which is given in institutions called "royal *Athénées*," if they depend directly on the State; and *collèges communaux* or *patronnés par la commune*, if they are maintained by the *communes* or receive grants of money or endowments of land, etc., from them.

"ÉCOLES MOYENNES" provide lower middle-class children not intended for a profession with practical, utilitarian instruction, more highly developed than that given in the elementary school. The period of attendance is three years, either added to six

years' elementary instruction or combined with the supplementary grade established recently. The syllabus comprises the native language (French, Flemish, or German); a second obligatory language (French in Flemish or German neighbourhoods, and Flemish or German in Walloon neighbourhoods); a third optional language (Flemish, German, or English); geography; general history and the history of Belgium; elementary mathematics; elementary natural science applied to everyday life; hygiene; handwriting, book-keeping, and the elements of commercial law; drawing; vocal music; and gymnastics. In girls' intermediate schools, needlework and domestic economy are taught. Special commercial, industrial, or agricultural departments are attached to certain schools.

The teaching staff consists of a *directeur* (or *directrice*), *régents* (*régentes*), *instituteurs* (*institutrices*), and *maîtres* (*maîtresses*). The *directeurs* and *régents* of the *écoles moyennes de l'Etat* for boys must possess the diploma of *professeur agrégé de l'enseignement moyen* conferred by the special boards of examiners appointed by the Government in the State intermediate normal departments and at many "free" (*libres*) normal schools. (*Docteurs en philosophie* and *docteurs en science* are excused the production of this diploma.) The same is the case with the *directrices* and *régentes*. The training of the teachers is organized, for boys, at Ghent and Nivelles, and, for girls, at Brussels and Liège. The course lasts two years: the first year leads to the certificate of *aspirant-professeur agrégé* or *aspirante-régente*; the second prepares for the final diploma of *professeur* or *régente*. Anyone, no matter where he may have studied, may present himself before the examining board at any of these schools.

ROYAL ATHÉNÉES AND COLLÈGES COMMUNAUX. Close relations exist between higher secondary education and the universities. To be admitted to the university, the pupils of both official and "free" schools must, in obedience to the law of 10th April, 1890, show proof by a certificate that they have pursued with advantage a course of "humanities" (ancient or modern) according to the particular study they intend to take up. In default of this certificate, candidates for degrees must undergo a preliminary test. A special examining board, appointed annually by the King, is charged with the duties of verifying the certificates and proceeding with the preparatory tests.

The number of *Athénées* must not exceed twenty; that of the *collèges communaux* or *patronnés par la commune* is not limited by law: there are, at present, fifteen of them. There are also numerous "free" colleges, which are mostly under episcopal direction ("little seminaries") or conducted by the Jesuit Fathers. The *commune*, with a royal *Athénée*, provides a convenient building, furnished with equipment in good order, and the upkeep is left to its charge. It contributes to the expenses by an annual allowance—as a general rule, one-third of the cost. The royal *Athénées* and other State schools receive only day pupils; but the local authorities can arrange with private individuals for the keeping of boarding-houses attached to the *Athénée* or intermediate school. There are in every *Athénée*, and in most of the communal colleges, two "sides," or schemes, of instruction: *ancient "humanities,"* subdivided into Greek and Latin, and Latin only; and *modern "humanities,"* which include in the higher classes a scientific division

and a commercial or industrial division. The course of instruction, including the preparatory class, lasts seven years. The Greek and Latin course is a preparation for the liberal professions and public offices. The course called merely Latin leads particularly to the special schools of the universities: in this, scientific instruction is more extended. The "modern humanity" course is characterized by the preponderance accorded to living languages, natural science, and mathematics. It provides a training for scientific careers, and for commerce and manufacture. The syllabus of "ancient humanities" comprises grammar and composition, both prose and poetry; the study of Greek, Latin, and French, besides Flemish, German, and English; history, geography, and outlines of the constitution and administration of Belgium; mathematics, natural science, drawing, handwriting, music, and gymnastics. The section of "modern humanities" comprises grammar, composition, and study of French, Flemish, German and English; history, geography, and outlines of the constitution and administration of Belgium; mathematics, natural science, commercial science, drawing, handwriting, music and gymnastics.

It is clear that what characterizes higher grade intermediate education is, on the one hand, the pre-eminence given to Greek and Latin; they are the sole means of approach to the learned professions. On the other hand, it is the elaborate system of division and subdivision of the pupils into "sides" and sets, which have no point of contact after the original branching, and lead inevitably to premature specialization. Of recent years, a reactionary movement of considerable force against this state of things has set in, and the Government has appointed a Commission to study the reforms which it would seem desirable to introduce into the syllabus. The labours of this Commission are not yet completed. Its inquiries have been directed to the possibility of prolonging the period of general subjects undertaken by all the pupils and so delaying the moment of specialization; and to ascertaining if the preponderating place assigned to the dead languages, and especially Greek, ought to be maintained, or if it would not be better to make instruction in the native language the centre of gravity of the syllabus. Should not a wider field be accorded also to the study of modern languages and natural science? By two unanimous resolutions, the Commission has reduced the maximum number of hours of lessons to twenty-seven a week; and shows a disposition to assign a more important place to physical exercises, athletic games, and systematic gymnastics.

The teaching staffs of the *Athénées* are composed of a *préfet des études, professeurs, and maîtres d'études or surveillants*. No one can be appointed to the post of *professeur or préfet des études* unless he is a native or naturalized Belgian, and has obtained the degree of Dr. en Phil. et L., Dr. en Sci. Phys. et Math., or Dr. en Sci. Nat., as the preliminary to a "professorship" in intermediate education. To be appointed to the post of *maître d'études or surveillant*, one, at least, of the examinations of the candidature in Philosophy and Letters, or in Science, must have been passed, or a certificate of complete studies in the "humanities" must be held. The Government makes the appointments in the case of the *Athénées*; the provinces or the *communes* appoint to the institutions which they direct.

The general management of intermediate education appertains to the Ministry of Science and Art, assisted by an inspector-general, four inspectors, and an advisory council. The last statistics (*Moniteur belge du 1^e Février, 1914*) give the following particulars—

<i>Écoles moyennes</i> (Boys)	90	with 20,123 pupils
<i>Écoles moyennes</i> (Girls)	44	" 10,249 "
<i>Athénées royaux</i> and		
Colleges	35	" 8,729 "

We must remember that there are a considerable number of "free" intermediate educational institutions (called "colleges" or "little seminaries"), which are, for the most part, under the direction of the episcopal authority or of the Fathers of the Society of Jesus. They account for a considerable part of the children of schoolage, and their schemes are very nearly identical with that of the official *Athénées*.

Higher Education. The laws of 1835, 1849, and 1890 restrict the term higher education to the universities and the schools attached to them. Higher education aims, not merely at preparation for the liberal professions, but also at general culture and the advancement of learning.

In two universities instruction is given at the cost of the State: one is at Ghent (*q.v.*), the other at Liège (*q.v.*). Besides these official institutions, there are two "free" universities: the Catholic University of Louvain (*q.v.*) and the "free" University of Brussels (*q.v.*).

Each of the universities contains the faculties of arts, law, science, and medicine. Louvain also has the faculty of divinity, and Liège that of technics (the school of arts, manufactures, and mines). In the faculty of science at Ghent, there is a school of civil engineering, arts, and manufactures; at Brussels, a polytechnic school; and at Louvain, there are schools of mining, civil engineering, arts and manufactures, architecture, and electricity.

The internal organization of all four universities is very much the same. The teaching is done by professors, ordinary and extraordinary; by *chargés de cours* and *agrégés*. Besides the regular staff, each State university possesses a large supplementary staff: *répétiteurs, chefs de travaux, assistants, conservateurs, préparateurs*, etc. The Rector is appointed by the King from each faculty in turn, and holds office for three years. The "Recteur Magnifique" of the Catholic University of Louvain is elected by the bishops, and his appointment is for life. At Brussels, the Rector is appointed annually by the administrative council of the university. In each of the State universities, a Government commissioner, called the administrative inspector, superintends the carrying out of rules and regulations; the care of museums, libraries, and other equipment; and the proper employment of the grants. At Brussels, there is an administrative-inspector appointed by the administrative council. This authority does not exist at Louvain, where the "Recteur Magnifique" has for assistant a vice-rector, appointed by the episcopal body.

Out of three methods of admission to the university—(1) absolute freedom of entrance; (2) an entrance examination; and (3) a school-leaving certificate—the Government chose the last. But there is a very marked tendency in favour of establishing an entrance examination. In each faculty the degrees are those of candidate and doctor. There are also the degrees of *candidat notaire*, pharmacist, and engineer (subdivided into

mining, industrial, civil, mechanical, etc.). The right of conferring these degrees, which are called "legal" degrees, because they allow those upon whom they have been conferred to practise certain professions in Belgium, or to occupy certain official positions for which the possession of a degree of the kind is required, belongs, not solely to the State universities, but also to the "free" universities that are composed of four faculties at least, as well as to examining boards set up by the Government, and consisting of equal numbers of *professeurs* drawn from official ranks and from the ranks of the independent educational institutions. These diplomas, however, have legal effect only after confirmation by a special commission sitting at Brussels. Women may obtain all the legal degrees; but they can practise only medicine and pharmacy. Besides legal diplomas, the universities confer *scientific* degrees, conveying no privileges or rights, but merely proofs of proficiency in this or that branch of knowledge. These degrees have increased in number of late years, and the universities have founded various chairs, which constitute new centres of research and scientific life. The recent endowment by America of 20,000,000 fr. to each of the Belgian universities will allow scientific life to be developed still more.

The oral courses in the faculties of arts and law are supplemented by practical exercises and private work. In science and medicine, research and practical laboratory work hold an important place. The authorities have founded many new scientific institutions, libraries, museums, and laboratories. Among remarkable private benefactions may be mentioned: at Ghent, the *Institut Rommelaere*, devoted to hygiene, bacteriology, and forensic medicine; at Liège, the Electro-technical Institute, due to M. Montefiore-Levi, whose name it bears; at Brussels, the *Institutes of Physiology and Sociology*, founded by M. Ernest Solvay; and at Louvain, the *Institute of Spoelberg*, belonging to the faculty of arts. With the object of promoting and facilitating these philanthropic acts, a recent law (12th Aug., 1911) conferred upon the Universities of Brussels and Louvain the civil rights of an individual person. This measure, allowing them to accept gifts and bequests, regularized a position which the French conception of the law of property had often rendered embarrassing, and should stimulate would-be benefactors, who need no longer have recourse to artificial arrangements and legal fictions to assure the effectiveness and permanence of their dispositions.

Statistics.

[BEFORE THE WAR.]

ACADEMIC YEAR, 1913-14.

University.	Students (Belgian).	Students (Foreign).
Ghent . . .	950	365
Liège . . .	1,351	1,533
Brussels . .	—	1,454
Louvain . .	2,568	322

[AFTER THE WAR.]

ACADEMIC YEAR, 1919.

University.	Students (Belgian).	Students (Foreign).
Ghent . . .	1,422	37
Liège . . .	2,808	169
Brussels . .	—	3,181
Louvain . .	3,128	52

C. DEJACE.

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BELGIUM, THE UNIVERSITIES OF.—Ghent and Liège. The two State universities are barely a century old. Founded by the same royal decree, organized under the same enactments, and subjected, through many political changes, to common experiences, they may be dealt with together. After the fall of Napoleon, the provinces to-day called Belgium were united to Holland, forming with her the kingdom of the Netherlands. In September, 1816, the new sovereign, William of Orange, established the State universities of Louvain, Ghent, and Liège. The first was short-lived, its philosophy exciting clerical resentment; but, though planned hurriedly and composed of rather miscellaneous elements, the others were both fairly prosperous when the Belgian revolution of 1830 broke out. The provisional Government suppressed certain faculties, and the universities might have ceased to exist had not "free" faculties been substituted. In 1835 the missing faculties were restored. The universities confer degrees, but their "legal" diplomas (professional or official qualifications) require Government confirmation. The law also sanctions central boards, consisting of State-provided and independent professors in equal numbers, which award the same diplomas subject to the same formality. Besides the faculties of arts, law, science, and medicine, there are at Ghent special schools of civil engineering, arts and manufactures (1838), a normal school of science (1847), and a commercial school attached to the faculty of law (1906); and at Liège a school of mines, now transformed into a technical faculty (1892), a normal school of the humanities, attached to the faculty of philosophy (1890), and a special school of commerce annexed to the faculty of law (1906).

Louvain. The university of Louvain was founded in 1425, at the request of Jean IV, Duke of Brabant, by Pope Martin V, under the name of *studium generale*. It was a time when humanism, drawing inspiration from the masterpieces of antiquity, was about to create a literary revival of unparalleled vigour. The university played a conspicuous part in that movement, and names like those of Erasmus, Justus Lipsius, and the army of professors who taught at the College of the Three



Basket Making at St. Dunstan's Blinded Soldiers' and Sailors' Hostel, Regent's Park, London



Birmingham University

Photo by Valentine

PLATE XI

Languages, made the new school illustrious. Its prosperity continued without a break down to the middle of the eighteenth century. Then the centralizing policy of the House of Austria; the meddling attitude of the Government, which rode roughshod over academic privileges and traditions; and, finally, its interference with Catholic doctrine, led to bitter struggles which came to a head under Joseph II. In 1788, the Government transferred to Brussels the faculties of law, medicine, and philosophy, and handed over the teaching to professors of its own way of thinking. But this new university had a short life. On 24th October, 1789, the people of Brabant proclaimed the deposition of the Emperor Joseph II, and the successful revolution procured the return of the *alma mater* to Louvain. But in 1792 the French entered the university town and, after a brief restoration of the Austrian power, occupied the city again in 1794. The Rector and professors, all but one in holy orders, having refused to take the oath of allegiance to the Constitution of the Year III, on 25th October, 1797, the ancient university was dissolved and its property confiscated. Belgium then came under the University of France, and three faculties were established at Brussels. This was the position in 1816, when William I of the Netherlands founded the State university of Louvain, which lasted until 1835. But, before this, the Church, taking advantage of the freedom proclaimed by the constitution of the new kingdom of Belgium, resolved to restore the old *studium generale*; and Pope Gregory XVI, on 13th December, 1833, founded at Malines the Catholic University, which a few months later was transferred to the venerable seat of the ancient university. The bishops exercise control through the Rector, who holds his office for life, and the university enjoys complete autonomy, subject, of course, to the laws which regulate all higher education. Besides the four usual faculties, the University of Louvain comprises a faculty of divinity, a special school of mines, civil engineering, arts and manufactures, architecture and electricity, a higher school of agriculture, the institute of orthodox Catholic (Thomist) theology, a school of politics, social science, and diplomacy, and a higher school of commerce and consular learning. The Catholic University is supported mainly by the voluntary contributions of its co-religionists. A recent enactment, dealing with the legal personification of the universities of Brussels and Louvain, will facilitate their endowment.

Brussels. The efforts of the Catholics excited the emulation of their adversaries. The leading Liberals determined to found a university untrammelled by creed or dogma. The scheme originated in the Masonic lodges, which advanced Liberals had made their centres of activity. On 24th June, 1834, M. Verhaegen proposed and carried a resolution at the *Amis Philanthropes* Lodge, of which he was Worshipful Master. Subscription-lists were opened at the provincial lodges. Six weeks afterwards, a provisional executive was nominated at a meeting of subscribers at the Brussels Town Hall. A month later, they met again to draw up statutes and elect a permanent committee. The formal opening took place on 20th November, 1834. The number of students at first was very small—only ninety-six—and the income hardly sufficed to pay the staff. But generous help presently enabled the financial difficulties to be overcome. In 1842, a school of pharmacy was opened; in 1873 a polytechnic

school; and a school of social science was founded in 1889. This triumphal progress was checked by internal dissensions, which paralysed the university for a time, and even led to the establishment of a rival institution which called itself the New University of Brussels. As the university recruited its students and supporters from the Liberal party, using that term in its widest sense, it is not surprising that the disputes and differences of Liberalism soon found themselves reflected in the lecture-rooms. The council was taken to task for its unfriendliness to new ideas and the men who professed them. It was reproached with having elected new professors for their opinions rather than for their merits, and a proposal was made to place the management of the university in the hands of the professors; others would have added the lecturers, and even the past and present students. Riotous scenes marked the opening of 1890; the disorder was renewed more seriously in 1894. Certain students were expelled and classes suspended. The energy of the council got over these troubles, and a revision of the statutes in a broader and more democratic spirit restored tranquillity. On 28th October, 1895, what may almost be looked upon as a second foundation of the university took place: the opening of the institutes in the Parc Léopold. In the middle of the park, stand M. Solvay's School of Commerce and Physiological and Sociological Institutes. At the other end is the Anatomical Institute, the gift of M. Raoul Warocqué; and a little further along is the Institute of Hygiene, Bacteriology, and Therapeutics. We must also mention the Botanical Institute, transferred to the university in 1895 by M. Leo Errera; and the Mechanical Institute, founded in 1899 out of funds collected by Professor Lucien Anspach. These numerous benefactions explain the prosperity of Verhaegen's modest foundation and how it has been able to live and grow entirely without State aid. The law of civil personification, already mentioned, will undoubtedly tend to add to them, and provides the two independent universities with legal means of possessing regular and reliable revenues. See also BELGIUM, THE EDUCATIONAL SYSTEM OF.

C. DEJACE.

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BELGRADE, THE UNIVERSITY OF.—There are three stages in the history of Belgrade University: (1) The "Lyceum," created in 1838, comprehended the Faculty of Literature and the Faculty of Science. In 1841, the Faculty of Law was added. In 1846 was created a separate Technical School. In 1853 this School was added to the Lyceum, and the latter was entirely reorganized; it was divided into three faculties: Literature,

Law, Science. (2) In 1863 the "Lyceum" was transformed into the "High School." It was divided into three faculties: Philosophy, Law, Technics. In 1871 the Philosophical Faculty was divided into two sections: Literature, Science. In 1880 the course of all faculties extended over four years. In 1896 the faculties became more independent of each other; they were subdivided into twelve special scientific sections, and seminary work was created for the students. (3) In 1905 the High School was transformed into the University, which has five faculties—Theology, Philosophy, Law, Technics, and Medicine.

The work of Belgrade University is of great importance. The University is the greatest focus of intellectual life in Serbia. It is the centre of scientific research. Every branch of study starts from the University, where it is performed methodically, systematically and thoroughly. The main object of these studies is the native country and folk, national history, language and literature, the country's minerals, its flora and fauna. Very careful attention is paid to foreign languages and history, philosophy, mathematics, etc.; and also to law, finances, and the applied sciences. It is impossible to over-rate the importance of such studies in a small nation. The study of the national past and present is the basis of every reform undertaken in public life. The study of foreign countries is most useful to a young nation. The University thus regenerates the entire intellectual, moral, and economic life of Serbia, exerting the greatest influence upon the progress of the country.

The progress of Belgrade University has been most remarkable. The Lyceum imparted merely a general and summarily encyclopaedic knowledge to its students. This was quite natural, in those days of Serbia's new-found freedom. The High School offered a sound and methodical training, yet it lacked special libraries, well-equipped laboratories, rich natural history collections, and seminary work. The University was the final stage of the ever-growing scientific development of the preceding institutions. It built its scientific achievements on a much larger scale, and upon a solid and thorough scientific and methodical foundation. The teaching staff is composed of eminent scholars, and the undergraduates are keenly devoted to science and learning. The University is also sufficiently endowed with libraries and laboratories. For instance, the library of the "Serbian Seminary"—one of twenty-five University seminaries—which, when it belonged to the High School, had only some hundred volumes in all, now contains 7,000 works in 12,000 volumes, and 250 periodicals in 10,000 volumes.

During the war, the University was destroyed by Austrian and German shells, and the rich collections and libraries have been plundered and removed by the enemy.

P. POPOVIC.

BELGRADE UNIVERSITY.—(See SERBIA, THE EDUCATIONAL SYSTEM OF.)

BELL, ANDREW.—(See LANCASTER AND BELL AS EDUCATIONISTS.)

BELLAY, JOACHIM DU (born about 1525).—He was a distinguished member of a small group of French writers, called the Pléiade, who set themselves to improve French poetry. The aims of the Pléiade were explained in du Bellay's *Defense et illustration de la langue Française* (1549), in which

the best Latin and Greek classics were recommended as models for French writers of verse. The ode and the sonnet should be adopted as models in order to reproduce their classical rhythm and diction. Du Bellay wrote many sonnets, and, in union with Ronsard, the leader of the Pléiade, his work contributed greatly towards bringing about changes in French literary thought and style. Spenser translated many of du Bellay's sonnets under the title *Ruins of Rome*, and Mr. Andrew Lang published a translation of a selection in *Ballads and Lyrics of Old France* (1872).

BEMBO, PIETRO (1470–1547).—Was born in Venice; studied at Padua and Ferrara, and became one of the greatest Italian scholars of the sixteenth century. He edited, for Aldus (*q.v.*), the Italian poems of Petrarch and, besides being a great writer, he became a liberal patron of literature and the fine arts. Pope Paul III made Bembo a cardinal and bishop. He was, for some years, librarian of the St. Mark's Library at Venice, and his numerous and varied writings are characterized by strict adherence to correct style in both Latin and Italian.

BEMBO, PETER.—(See CICERONIANISM.)

BENEFACCTIONS, EDUCATIONAL.—Education among the English may be considered to have commenced with the arrival of St. Augustine, who established a school at Canterbury, which Ethelbert, King of Kent, supported with an endowment. Many other schools were founded by bishops, and patrons were usually to be found ready to provide a permanent support by gifts of land and revenues. In this way the school at York was established in 1075, and its revenue was increased in 1557 by Cardinal Pole, who gave it the endowments of a hospital for poor priests in York. St. Paul's, in London, dates from 1111, and was enriched by Colet in 1510. William of Wykeham, in 1382, set up a school at Winchester giving it a revenue for the maintenance of masters and pupils. Henry VI did much to establish schools and colleges by appropriating the revenues of the Alien Priors; and to him Eton College, All Souls (Oxford), and King's College (Cambridge) owed their foundation.

Chuntries. Many founders of chantries directed that the chantry priests should keep a school to train singers for the services of the chantries; and revenues were left to defray the cost of these schools, of which the earliest was set up at Crewkerne in 1310. Many more were established between that time and the Wars of the Roses; and at the time of the Reformation there were about a hundred of them—some song schools and some grammar schools—and nearly all were free. The chantry schools were all dissolved in 1547, but a few were revived under Edward VI.

Charity Schools. The destruction of monastery and chantry schools left the poor unprovided with education; and the sixteenth century saw the rise of "charity schools," in which religious education was the first consideration. Gouge, a Nonconformist clergyman, ejected from his living in 1662, founded many charity schools in Wales, and in the early years of the eighteenth century the Society for Promoting Christian Knowledge extended the work. In these centuries, many schools were established and endowed by city merchants and merchant companies [*e.g.*, Christ's Hospital (Bluecoat); St.

Peter's, Westminster; the Merchant Taylors' and St. Margaret's, Westminster (Greycoat)]. The eighteenth century, too, saw the founding of many orphan asylums, which increased in numbers more rapidly in the nineteenth century, when, also, there was a great movement for the establishment of grammar schools, public schools, and colleges.

The endowment of elementary schools ended in 1870; and, since then, more has been done by benefactions for higher education, including the universities, with which in recent years the names of Carnegie and Rhodes have been associated.

BENEFIT OF CLERGY.—The privilege possessed by the ordained clergy of exemption from civil punishment. It was one of the results of William I's separation of civil from ecclesiastical courts. Later, "clergy" came practically to mean ability to read, and until 1827 it was possible for a criminal condemned to death to claim "benefit of clergy," and, if he could read the first verse of the 51st Psalm, he escaped capital punishment. The test verse became known as the "neck verse" (e.g., Scott's *Lay of the Last Minstrel*, I. xxiv.).

BENEKE, FRIEDRICH EDUARD (1798–1854).—A German teacher and psychologist. In his early studies he followed English philosophical writers, and when appointed lecturer at Halle University (1820) he began his life-long opposition to the abstract system of German philosophy of which Hegel was the leader. The Prime Minister silenced Beneke for his opposition to Hegel, and he removed to Göttingen, where he lectured for three years, and published *Psychologische Skizzen*, in which he laid down his new psychological doctrines. In 1832 he succeeded Hegel, and brought out works in rapid succession, including *Lehrbuch der Psychologie als Naturwissenschaft und Erziehungs- und Unterrichts Lehre*, in which he applied his views practically to education. Beneke's philosophy, like that of Locke, analyses *ideas* as presented by the phenomena of man's *inward* experience, which presents a mass of *facts* of which the philosopher investigates the origin, development, connection, and discovers the *laws* of operation. Beneke was, like all enthusiasts, one-sided, but was one of the most remarkable among promoters of more correct views on psychology and education; and his works are indispensable to all wishing to understand what has been accomplished in these two branches of study.

BENEVOLENT FUND, THE HOPKINS.—(See PRECEPTORS, THE COLLEGE OF.)

BENEVOLENT AND ORPHAN FUND OF THE NATIONAL UNION OF TEACHERS, THE.—The foundation of the Union in 1870, and *The Schoolmaster* in 1871, formed closer bonds between teachers, showing the value of co-operation in all directly professional matters, and also in benevolence and providence. At first, this spirit showed itself in frequent appeals in *The Schoolmaster* for subscriptions in aid of sad cases of orphanage, bereavement, or breakdown. These appeals quickly emphasized the necessity for some systematic way both of helping these sad cases and of seeing that the help was given with discrimination. At the earlier conferences of the Union, various schemes were discussed, which finally resulted in the adoption of separate provident and benevolent schemes in 1877, followed by the institution of an orphan

and orphanage scheme in 1878. The last two were quite separate and distinct till 1898, when they were united as the Benevolent and Orphan Council of the N.U.T.

Council. The Council is constituted of twelve members elected from the Executive of the N.U.T.; four each from the North, East, and South London areas respectively; and one each from the other nine electoral areas. All the elections are annual, and the Council elects annually from its members a Vice-Chairman, who becomes Chairman in the succeeding year.

Benefits. The benefits are either those restricted to subscribers or those enjoyed also by non-members. In the first class are—

(a) **ANNUITIES.** These are given by annual election, the subscribers electing three-quarters of the total decided upon, and the Council the remainder, from a list of those eligible. The maximum given is £40 per annum, but this is subject to a total income limit of £78 per annum, or £96 if wife or husband is dependent. Candidates must either be teachers or the widows of teachers. The first two annuities were granted in 1881.

(b) **LOANS.** These are granted in emergencies to subscribers of at least two years' standing, who must provide two satisfactory sureties. They are limited to £25.

(c) **CONSULTATIONS WITH SPECIALISTS.** Arrangements have been made with various eminent specialists, by which members can secure the best advice whenever necessary.

(d) **HOSPITAL LETTERS.** The Council subscribes annually to various types of hospital, and is thus able to give letters of admission or for treatment.

(e) **SURGICAL APPLIANCES.** The Council also subscribes to the Hospital Saturday Fund, and is, therefore, able to secure surgical and other appliances for its members at reduced terms.

In the second class come—

(a) **TEMPORARY RELIEF.** This is the work upon which most money is spent. Subscribers are treated more favourably than non-subscribers; but every case of real want is helped according to its needs. The most costly cases are those of consumption and nervous breakdown. Sanatorium treatment is given in all consumption cases where likely to be beneficial, three months' treatment at £2 2s. per week being the usual minimum grant, followed by periods extending sometimes to two or three years, if ultimate benefit is probable. The number of consumption cases, especially among young women teachers, is serious, and shows signs of increase rather than decrease. Generally, the total benefit granted under relief is limited to £26, but in exceptional cases this is frequently exceeded. Both uncertificated and supplementary teachers are eligible, especially if they are subscribers; but every care is taken that they receive the full benefits of the National Health Insurance Act, under the terms of which they are compelled to subscribe.

(b) **ORPHANAGES.** The first orphanages were opened in 1884 for boys, and in 1887 for girls. When the Orphanage Fund was started in 1878, there were only 27,000 certificated teachers, and it was intended to provide places for 300 boys and girls. At present, the Council maintains an orphanage for sixty boys at Sydenham, and one for thirty-four girls at Sheffield. Elections to vacancies are held in October, at the same time as those for annuities and home allowances. Both Homes are the Council's freehold property, and it is indebted

to a generous gift of £6,000 from Mr. Passmore, and a magnificent effort of the London teachers in 1902, for the opportunity of purchasing Westwood House, Sydenham. The London teachers contributed no less a sum than £13,868, sufficient to provide the balance necessary for the purchase and to leave a sum of £2,361 for the maintenance of the fabric.

(c) HOME ALLOWANCES. These are also granted annually by election of the subscribers, and amount to 5s. per week up to the age of 12; 7s. 6d. a week onwards till 14; and 10s. per week until 16.

(d) SPECIAL GRANTS. These are given without election in necessitous cases, and amount to 3s. 6d. per week for twenty-six weeks, renewable so long as the necessity continues.

Subscribers and their Privileges. Any teacher subscribing not less than 5s. per annum is a Subscriber, and can vote for one Annuity, one Home Orphanage, and one Home Allowance candidate. Any teacher subscribing or collecting £5 in not more than two years is called a *Life Subscriber*, and has the same voting privilege as an Annual Subscriber.

Each Local Association of the N.U.T. has a Benevolent Local Board, and can grant up to one-third of its previous year's subscriptions without reference to the Council, but subject to the same rules. Every case must be recommended by a Local Board before it can be considered by the Central Council.

The entire benefits granted in 1878 were Temporary Relief, £9 8s. 6d., Loans, £10; those granted in 1919 appear below—

Benefits.	Value of Benefit.		
	£	s.	d.
Annuities	9,457	14	4
Loans	356	0	0
Hospital Subscriptions	177	15	0
Temporary Relief	10,471	1	6
Boys' Home	3,521	12	5
Girls' "	1,433	19	2
Home Allowances	1,599	9	6
Special Grants	328	10	6
	£27,346	2	5

The investments of the Funds are valued at £31,279. C. W. C.

BENTHAM, JEREMY.—Jeremy Bentham, born in 1748 and dying in 1832, exactly filled the period when English education was approaching new life. In 1748, education in England, for practically all except a few university scholars, was at its lowest ebb. In 1832, the great awakening at the universities had begun, and regularized State intervention in elementary education was only to wait one more year. This is not the place in which to write of Bentham's brilliant and precocious childhood; of his education at Westminster and Queen's College, Oxford (where he attended Blackstone's famous lectures, which he subsequently [1776] attacked in his *Fragment on Government*); of his great and not altogether unsuccessful efforts to reform the administration of English law, and to deal with the legal fictions which, in his view, marred—though they really illustrated—the great English system of jurisprudence; of his theories of morals and of legislation; of his attacks on religious tests, and his not unavailing efforts to change and strengthen

the greatest Civil Service that the world has seen. To a mind so intimately engaged in the solution of the various social problems by laying down general principles few of which are accepted in their entirety to-day, it was impossible not to come to grips with the educational problems that arose in his middle life.

Treatment of Educational Problems. Thus (see *State Intervention in English Education*, J. E. G. de Montmorency, p. 218), in his Plan of Parliamentary Reform (Sec. VII, *Works*, Vol. iii, p. 464), this political philosopher, realizing that an ignorant electorate was the chief danger of democracy, proposed, in 1809, that those who could not read should be deprived of the vote. In his Radical Reform Bill, he denies that any injustice would arise from that proposed reform, which the fearful corruption of Parliamentary elections seemed to demand. He writes: "From two or three months' social pastime, at the hours of repose from work, would give it [the vote] to all adults in whose eyes the privilege were worth that price; and he, in whose eyes it were not worth that price, could not, with much justice, complain at the not having it." In the same spirit, the New Zealand Legislature of our day has deprived any voter of the vote if he or she fails to exercise it. Bentham's idea of an educational franchise has had a far-reaching influence. Lord Brougham in his Franchise Bill of 1837 adopted it.

Sir Michael Sadler tells us, concerning *Chrestomathia*, which Bentham published in 1816, that the philosopher elaborated "a plan for secondary education which gave physical science a prominent place, and attacked the supremacy of the classical languages. By this work, he turned the thoughts of many liberal educational reformers towards a one-sided and narrow conception of secondary education." In his Constitutional Code (*Works*, Vol. IX, pp. 271–83), published in 1827, Bentham set out certain educational proposals of great value. Thus he advocated the general adoption of the educational principle laid down by de Mist (the Dutch Commissioner-General at the Cape of Good Hope) in his famous School Ordinance of 1804, that no person should become a Government official unless he had reached a certain standard in the Government schools; and (to quote Sir M. Sadler once more) "he devised a detailed plan for requiring every candidate for an official position under Government to pass a competitive examination in certain branches of knowledge bearing upon his future work." This plan was the progenitor of the modern system of selection for the Civil Services—a system, perhaps not the best, but one that has given an efficient service.

His Characteristic Work. Bentham's was both a distinctive and a constructive mind. He saw evils with a vivid appreciation of their results. In *The Book of Fallacies* (*Works*, Vol. II, p. 468), he published a bitter and deserved satire on the educational work of Oxford and Cambridge in the eighteenth century, but we may doubt if he foresaw the great revival that was slowly coming when he was at Oxford. He did not realize that a decadent age contained all the elements and material for revival, and he believed that all that was necessary for a new world was a statement of general sociological principles. Bentham would have swept much away that has proved invaluable in the revival of English educational life; but, on the other hand, he clarified the minds of men on most

subjects, and was the great forerunner of the clear, if limited, thought of John Stuart Mill and Herbert Spencer, particularly in educational matters, where his indirect influence has been far greater than is generally realized. J. E. G. DE M.

BENTLEY, RICHARD.—(See CLASSICAL LEARNING AND CRITICISM.)

BERKELEY, GEORGE (1685–1753).—Entered Trinity College, Dublin, in 1700, and became a student of the philosophical works of Descartes, Newton, and Locke. In 1705 he wrote his *Commonplace Book* (not published till 1871), and, in 1709, his *New Theory of Vision*. In these works he advanced the theory that there is no reality apart from perception, and that substance and matter cannot exist independently of perception. He wrote a popular exposition of his theory in 1713, named *Dialogues between Hylas and Philonous*. Berkeley's theories roused much controversy among contemporary thinkers, and were attacked by Hume, Johnson, and others. In 1733 he published *Alciphron*, a dialogue on religion, and, in 1744, *Sims*, on the use of tar water as a specific against diseases.

BERKHAMSTED SCHOOL.—Dean Incent of St. Paul's, in the reign of Henry VIII, founded a grammar school at Berkhamsted for 144 boys. He endowed it liberally, and the King granted it St. John's Hospital, his successor confirming the gift. The school suffered a great deal from mismanagement and litigation, but it was re-established in 1841, and its endowment now is well over £1,200 a year. There are upwards of 450 boys, half of whom are boarders in five houses. The course of instruction is as is usual in the lesser public schools, the science work being particularly good. The buildings are modern, spacious, convenient, and picturesque, and all the accessories of an up-to-date, middle-class boarding-school are provided at a moderate cost. Three senior scholarships (£12), two junior (£8), and a number of free places are assigned annually, besides a leaving exhibition of £60 for four years. The gymnasium and cadet corps have done well in the inter-school competitions at Aldershot and Bisley.

BERLIN, THE UNIVERSITY OF.—The founding of the University of Berlin was a direct consequence of Prussia's humiliation in the Napoleonic Wars. The Peace of Tilsit (9th July, 1807) ceded to France the Prussian territory south of the Elbe, including Halle with its university. A month after the signing of the Peace, two professors of Halle, Schmalz and Frierp, laid before King Friedrich Wilhelm III a proposal for the transference of the University of Halle to Berlin. The proposal did not find favour with the king, but he declared his intention of establishing, without detriment to the other Prussian universities at Königsberg and Frankfort-on-the-Oder, a new university in his capital. The first step was taken in September, when the Chancellor was empowered to invite a number of distinguished scholars and scientists, amongst them the two men whose names have been mentioned, Fichte, Schleiermacher, Hufeland, and Wolf, to form the nucleus of the teaching body of the new university. A year later, Wilhelm von Humboldt (*q.v.*) was appointed head of the Education Department of the Prussian Home Office, and the plans were placed in his hands.

In a very special sense, the University of Berlin is the creation of Humboldt; and he approached his task, not merely as a statesman, but also as a scholar who had profound insight into the problem of education and the meaning and function of a university. From the first he determined that it should be something more than the university of a narrowly defined province, like the universities of Königsberg and Frankfort. It is greatly to the credit of Prussia that this momentous step should have been taken when her political fortunes were at their lowest ebb. But, as Humboldt wisely said in his report on the University to the king: "A State, like a private individual, always acts well and politically when, under the shadow of unfavourable circumstances, it puts its strength into establishing something permanently beneficial."

Thus, at a time when Napoleon was reorganizing the education of France, cutting and pruning it according to his military lights, reducing the whole to uniformity and subservience to the "université impériale" of Paris, Prussia, under the wise guidance of Humboldt, was laying the foundations of the greatest of modern universities. In doing so, she went back to the old mediæval conception of a free and "universal" university, whose aim was not the inculcation of scheduled learning or limited knowledge tested by examinations, but which was a community of teachers and taught, for the advancement of knowledge by investigation and research. To Humboldt, Germany owes the basic principle that the university professor must be not merely a teacher, but also a furtherer of learning and science. On 16th August, 1809, the king issued a Cabinet order to the Minister of Finance, authorizing him to take the final steps, and in this order he expressed his wish to make the University an integral part of the organized learning of Prussia, as well as a great educational centre: the *ersten Männer jeden Fachs* were to be attracted to the capital, and the many scientific institutes and collections of Berlin were to be united into one organic whole with the new university.

A yearly income of 150,000 talers was granted to the University and the institutions associated with it, and it was housed in the palace of Prince Heinrich, a building which it still occupies. In recent years, however (1889–91), the palace has been entirely rebuilt, while the many seminars and institutes are scattered through the city and its suburbs. The University opened with the winter semester of 1810–1811. It had the usual four faculties of Theology, Law, Medicine, and Philosophy or Arts: the number of teachers was 46, including 25 ordinary or full professors, 7 extraordinary professors, and 14 privatdocenten; the number of students in the first session was 256. By 1818 the matriculated students exceeded 1,000, while the number of teachers had increased to 73. In 1824 there were over 1,500 students and 94 teachers, but the attendance remained for a generation more or less stationary; indeed, in 1860, the number of students was slightly under 1,500. Meanwhile, however, the number of teachers had gone on steadily increasing, and in 1870 there were 168; and 345 in 1896. Unmatriculated students were permitted to attend lectures for the first time in 1830, when over 450 took advantage of the privilege. Some thirty years later, this number had doubled itself, and it has always been a strong feature of Berlin academic activity. As the War has introduced quite abnormal conditions, the following

statistics of the Winter semester of 1912-13 will give the best idea of the University at its fullest development—

Faculties.	Ord. Professors	Extra-ord. Prof.	Privat-doc.	Lectors.	Matr. Students.	
					Men.	Women
Theology.. ..	11	5	10	—	534	4
Law	14	8	10	—	2,106	20
Medicine	30	37	136	4	1,954	178
Philosophy ..	69	47	132	9	3,735	657
	124	97	288	13	8,329	859

Besides these 9,188 students, the number of unmatriculated students was 4,748 men and 1,101 women.

The above statistics show how Berlin has shared in what must be regarded as the most prominent feature in the evolution of the modern German university, namely, the development of the Faculty of Philosophy or Arts, which now dominates the faculties whose more immediate function is to train for the professions. The number of ordinary professors alone in that faculty is now more than five times what was regarded as sufficient in 1810. This extension of the University's activities in the direction of pure science and scholarship, apart from its functions as a training school for clergymen, lawyers, and doctors, was inherent in Humboldt's plan from the first.

The annual expenditure of the University before the War was reckoned at about 5,000,000 marks, of which 2,000,000 went to the payment of salaries, and a similar sum to the upkeep of the various seminars, institutes, and collections. The income consists of a State grant of over 4,000,000 marks; of fees (more than 800,000 marks), and the interest on invested capital and property, of which the University possesses something like 10,000,000 marks.

The General Organization of the University will be found described in the article on German education (see GERMANY, EDUCATION IN); but Berlin differs from the other German universities in several respects. Its teachers, for instance, receive higher official salaries. These, in accordance with a minimum scale fixed in 1909, were until the War for ordinary professors, 4,200-6,600 marks; for extraordinary professors, 2,800-4,800 marks; but, in both cases, where subsidiary sources of income were inadequate, the Government was prepared to grant an increase up to 1,200 marks. Besides these fixed salaries, the teachers receive, of course, fees, as well as an annual sum for house-rent. A Widows' and Orphans' Fund, which ensures the widow of an ordinary professor a pension of 2,000 marks, and of an extraordinary professor, 1,600 marks, has existed in Berlin since 1818.

A fee is charged both for matriculation (18 marks; students coming from other universities, 9 marks) and for ex-matriculation (12 marks 50 pf.). Class fees are calculated on the basis of 5 marks per semester for a course of one hour weekly; 10 marks for two hours, and so on; but in the case of practical classes and laboratories, the sessional fee may be as high as 120 marks. The acquisition of the doctor's degree—the only degree conferred—costs, in Theology, 185 marks; in Law, 355 marks; in Medicine, 300 for one examination, 500 for the other; and in Philosophy, 355 marks; while the candidate has, after having passed his examination,

to supply the University with a large number of printed copies of his doctoral thesis.

Seminars, Institutes, and Laboratories. A particularly admirable feature in the University of Berlin is its highly developed system of seminars, institutes, and laboratories. The seminar is the "laboratory" of the student of humanistic learning; it is here he is taught the methods of research and criticism, which it is the highest object of the University to teach; and here he makes his own essays, which result ultimately in the doctoral thesis. There are no less than twenty such seminars in Berlin: two in Theology, three in Law, and some fifteen in Philosophy. Each of these is provided with a special library, and endowed with a sum to meet its upkeep. The endowment in Berlin varies from 500 marks each for the Philosophical Seminar, English Seminar, and Romance Seminar, and 1,200 marks for the German Seminar, to 5,500 for the Classical Seminar or *Institut für Altertumskunde*, and 6,050 for the Historical Seminar. The *Seminar für orientalische Sprachen* is established on a more independent basis and has an income, including its fees, of over 200,000 marks; the number of students in 1912-1913 was 343, and the number of teachers, 48. The scientific and medical institutes are naturally much more highly endowed: the Anatomical Institute receives, for instance, an income of 56,000 marks; the Physiological Institute, 63,000 marks; the Chemical Institute, 60,000 marks; and the Physical Institute, 30,000 marks. These figures it need hardly be added are pre-war. There are over twenty of these, not including institutes attached to museums or hospital clinics.

Achievements. No other single university has contributed so much to the learning and scientific progress of the past hundred years as Berlin. With men like Fichte—the first Rector of the University—and Hegel, Berlin at once asserted itself as a centre of philosophic thought and teaching, and as the successor of Königsberg and Jena. Indeed, for the first twenty years of its existence—that is to say, in the essentially philosophic epoch of German intellectual history—Berlin, in the person of Hegel, virtually dominated German thought, voiced what might be called the State philosophy of Prussia, and laid down the lines of Prussian education generally. Schleiermacher was the leader in a revival of theological study in the fervid individualistic spirit of the new Romantic movement; and, later in the century, the Berlin theologian Hengstenberg, as the representative of a new and more positive school of thought, held the balance with the powerful Tübingen school in the south. The appointment of F. A. Wolf among the first teachers of the University ensured its position as a centre of classical studies; and, under the leadership of great scholars like Niebuhr, Boeckh, Lachmann, Curtius, Mommsen, and (in Greek philosophy) Trendelenburg and Zeller, down to Wilamowitz-Moellendorf in our own day, Berlin has never lost its position of leadership in this branch of learning. From Göttingen came Jakob and Wilhelm Grimm, and laid the foundation of the study of German philology, which was further developed in Berlin under Lachmann, and Lachmann's successors Haupt, Müllenhoff, and Scherer. Bopp, the founder of Comparative Philology, and Lepsius, the Egyptologist, both taught in Berlin. But it is in the study of History that the University has played its chief rôle; for Leopold von Ranke, Germany's greatest historian, taught in the

University from 1825 to 1872, and from Ranke's school all the leading German historians of the later nineteenth century have graduated. Droysen was professor in Berlin, and Sybel was, if not professor, at least closely connected with the Berlin historical school as Director of the Prussian Archives; while in more recent times, Treitschke, the brilliant exponent of modern Prussia's political ambitions, gathered round him enormous audiences. Berlin's share in the making of modern science has been hardly less imposing. Amongst her professors of Chemistry were Mitscherlich, and Liebig's most distinguished pupil, Hofmann; in Physics, Kirchhoff; in Mathematics, Weierstrass. Ritter, as Professor of Geography, first raised his subject to an exact science; and Johannes Müller laid the foundations of a new school of Physiology, which has influenced the entire subsequent evolution of that science. In Medicine, besides Müller, the names of Schönlein, Dubois-Reymond, Helmholtz, Langenbeck, and Virchow speak for what the medical sciences have owed to Berlin. Lastly, in Jurisprudence, Savigny, with whom Eichhorn was associated, created the historical school of Berlin, which profoundly influenced all later speculation on the evolution of Law; Gneist taught in Berlin, and also Heseler and Dernburg. Such is only a part of Berlin's record but it more than justifies the glowing tributes from all sides, with which the celebration of the first centenary of the University was greeted in 1910.

J. G. R.

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BERMUDA. EDUCATION IN.—(See JAMAICA AND THE BRITISH WEST INDIES, EDUCATION IN.)

BERNARD, THOMAS (1750–1818).—Was trained for the law, but, acquiring wealth by marriage in 1782, he gave up his professional work and devoted his life to the improvement of the condition of the poor and suffering. He greatly assisted the Foundling Hospital, which had been established by Captain Coram in 1739, and took up the cause of young children who were employed by chimney-sweeps and in cotton factories. In 1799 he promoted the plan for the Royal Institution, which was to be an association of learned men in England similar to the Institute of France, and largely through his efforts the Institution received the Royal Charter in 1800. After being appointed Chancellor of the diocese of Durham in 1801, he established at Bishop Auckland, in 1808, a training school for teachers, and placed it under Dr. Bell. This was the first establishment of the kind in this country. To advance his plans, he published, in 1809, *The New School* and, in 1812, *The Barrington School*. He was also associated with the publication of the *Director*, the weekly paper of the Royal Institution. The Society for Bettering the Condition of the Poor owed its origin (1798) to the interest of Bernard,

Wilberforce, and others. In 1800 he was instrumental in founding a school for the indigent blind, and in 1801 the Fever Institution. In 1812 he assisted in forming an Association for the Relief of the Manufacturing Poor, and in 1813 the Fish Association for the Benefit of the Community. In connection with these associations, he vigorously attacked the salt duties, and, as a result of his agitation, a Bill was introduced into Parliament to reduce the duty upon rock-salt used in agriculture. His exertions, however, hastened his death, and he was buried in a vault under the Foundling Hospital.

BERNARD OF CLAIRVAUX. — (See SCHOLASTICISM.)

BERNE UNIVERSITY.—Was formally established in 1834, with faculties of law, philosophy, medicine, and theology. It was based on an earlier institution which arose in Reformation times, and was known as the Zwingli School. The University has a very large library containing many valuable manuscripts. Men and women are admitted, and about two thousand students annually attend.

BERNOULLI, THE.—The early development of Leibnitz's infinitesimal calculus is inseparably connected with two members of the Swiss family of Bernoulli. Jacob Bernoulli (1654–1705), Professor of Mathematics at Bâle from 1687 until his death, was a skilful user of the calculus. The chief interest of his work is its application to many ingeniously devised geometrical and physical problems.

Johann Bernoulli (1667–1748) was professor successively at Groningen, Leyden, Padua, and Bâle; he showed himself to be a more original and aesthetical-minded mathematician than his brother. His earliest distinguished pupil was the Marquis de l'Hospital (1661–1704), who published at Paris, in 1696, the first text-book on the differential calculus (*Analyse des infiniment petits*), which seems to have contained the substance of much of Johann Bernoulli's lectures on the differential calculus. De l'Hospital did not use the lectures on the integral calculus written out by Johann Bernoulli about 1691, which, published later by Bernoulli himself, were a first attempt to treat the matter systematically and with a large collection of geometrical illustrations. For Leibnitz, what we now call, after Jacob and Johann Bernoulli, the "integral calculus" was a *calculus summatorius*; for Johann Bernoulli, and most teachers after him down to the present day, integration was primarily defined as the inverse of differentiation. Johann Bernoulli was the first to treat trigonometry as a branch of analysis; he also began to speak, in a somewhat modern sense, about "functions" in general; and the theory of functions from the time of his pupil Euler (*q.v.*) has become fundamental in most modern mathematics. There were several other members of the family of Bernoulli, but none nearly so important for mathematics as Jacob and Johann.

P. E. B. J.

BERYTUS, SCHOOL OF.—A famous school for law students, dating from about the middle of the third century A.D., and one of the two schools to which Justinian restricted the study of law in 529. The course of study was laid down by the emperor, and the age of the students limited to 25. Berytus

was situated a few miles north of Sidon, on the coast of the Levant.

BESANÇON UNIVERSITY.—Originally established in 1691, was suppressed in 1793, and revived in 1896. Its faculties are those of arts, medicine, pharmacy, and science. It has about two hundred and fifty students. It is known to many British students because of its holiday courses for foreigners.

BESANT, WALTER (1838–1901).—Educated at King's College, London, and Christ's College, Cambridge; devoted himself to literature, and wrote many novels characterized by correct delineation, based on first-hand knowledge, of many phases of life and character, as well as by charming humour. In conjunction with James Rice, *Ready-money Mortiboy*, *This Son of Vulcan* (on the great discovery of iron-ore in Cleveland), and *The Golden Butterfly* were produced. The last-named novel deals with the educational dreamers who are always "going to do" something great, but lack stimulus. After the death of Rice in 1882, Besant wrote *All Sorts and Conditions of Men*, which caused a considerable stir in the educational world, and led to the establishment of the East End Institute, known as the People's Palace, in the Mile End Road, London. Combined with *Progress and Poverty* (George), and *How the Poor Live* (Sims), Besant's novel did much to assist the work of Canon Barnett in the foundation of the University Settlements (*q.v.*) movement and the establishment of Toynbee Hall (*q.v.*). In *The Children of Gibeon*, Besant attacked the sweating system, and in 1873 he brought out *The French Humourists*. Works on London and Westminster appeared in 1892 and 1895, and at the time of his death, Besant was engaged on *A Survey of London*, which, unfortunately, was not completed. Among the monuments to Besant's memory is the Society of Authors (*q.v.*), which he founded in 1884, and of which he was president until 1892; his *Autobiography* appeared in 1902. Besant was knighted in 1895 as a reward for his public services and literary work.

BEZA, THEODORE DE (1519–1615).—Was born in Burgundy, and studied at Orleans. He proposed to enter the Church, but his studies led him towards the Reformers, and about 1548 he joined Calvin at Lausanne, and, in 1559, became Professor of Theology with him at Geneva. He gave lectures on the New Testament, and translated it into Latin. After Calvin's death, Beza became the leader of the reformed Church in France.

BIBELESWORTH, WALTER DE (thirteenth century).—He was the author of a series of French poems, dedicated to Lady Dyonsia de Mouchensy, and composed with the purpose of teaching her the French language. On the occasion of the expedition of Edward I to the Holy Land, Bibelesworth composed a dialogue on the subject of the Crusade.

BIBELESWORTH, WALTER DE.—(See **ANGLO-NORMAN IN ENGLAND, THE USE OF.**)

BIBLE AND PURITAN PIETY, INTENSIVE STUDY OF THE.—The scholarship of the seventeenth century in England was mainly centred on the Bible and theological doctrines founded upon it, and on primitive Christianity, involving patristic studies. The classical studies of Latin and Greek

were subsidiary to these central subjects. Latin, Greek, and Hebrew held their honoured place, chiefly because they were the "holy" languages, and of predominant value for the elucidation of "holy writ." England became the people of one Book, and that book the Bible. It was the rule and standard of all life—religious and secular. If we take the year 1516 as starting-point (the date of the issue of the first edited Greek text of the New Testament, together with first modern translation of the Greek into Latin), and the year 1611 (the date of the authorized translation of the Bible into English), a period just short of a century, we find the enormous power of research developed by the Renaissance classical studies has been diverted from the classics; and the main intellectual energies of English scholars have become theological and pietistic, basing themselves upon a historical foundation, reaching back to the times of the Old and the New Testaments, and including next in order of inheritance the early fathers of the Church. Beside the translations of the Bible and its direct teaching, come the question of interpretation, and any one may realize the vast development of learning (1516–1657) by consulting the six folio volumes of the Polyglot Bible, edited by Brian Walton, Bishop of Chester, 1657, with its texts of Hebrew, Chaldaic, Samaritan, Syriac, Arabic, Aethiopian, Persian, Greek, and Latin, together with appendices, tables, various readings. As for criticisms of foreign and English scholars, the vast collections, entitled *Critici Sacri*, in Latin, of the thirteen folio volumes originally edited by John Pearson (1698–1732), and of Matthew Poole, also in Latin, *Synopsis Criticorum*, in five volumes, show a wealth of interpretation never approached on any subject of study. These vast compilations were only selections. Milton, in 1659, said any minister could well be trained in learning at any "private house," without recourse to any university, "else to how little purpose are all those piles of sermons, bodies and marrows of divinity, besides other sciences?" Many of them were in English, and were the subject-matter of absorbed study by laymen as well as ministers. Of expositions on the Bible, some of the more famous were Joseph Caryl on Job in two folio volumes, of 4,690 pages; William Greenhill wrote nearly 3,000 quarto pages on Ezekiel; Jeremiah Burroughs supplied a Commentary which did not finish to the end of the thirteenth chapter of Hosea, yet occupied four quarto large volumes. John Owen wrote four volumes on the Hebrews. Still more striking are the expository sermons. Thus Anthony Burgess, in 1656, wrote 145 expository sermons on the seventeenth chapter of St. John, which take up 702 folio pages. His commentary on the first chapter of the Second Epistle to the Corinthians filled a folio volume of 657 pages. In 1635, Arthur Hildesham wrote 152 lectures on the 51st Psalm.

Studies of the Scriptures were correspondingly intensive. Joshua Hoyle (*d.* 1654), Professor of Divinity at Dublin, described as master of all the ancient learning of the Greek and Latin early fathers, expounded the whole Bible, seldom taking more than one verse at a time. Over this process he took fifteen years, and in ten years went through the greatest part of it again. It was the highest recommendation of the Puritan minister that he was "mighty in the Scriptures." The attitude is marked from the return of the exiles from Zurich, Strassburg, and Geneva, at the beginning of Queen Elizabeth's reign. Bishop Jewel claims for Protestants: "We

have translated the Sacred Volume into *all* languages; they (papists) scarcely suffer it to exist in one. *We* rely upon the power of knowledge; they of ignorance." This claim was insisted upon throughout the seventeenth and eighteenth centuries. The Bible was taught intensively: in the pulpit, in the school, in the home.

In the Pulpit. Systematically, the ministers worked through the Bible, often indiscriminately, regarding all portions as of equal value, because all was equally "the Word" of God. Calvin was the real theological conqueror of England. The clergy in the first half of the seventeenth century was a learned clergy; the Nonconformist ministers of the second half were learned in Latin, Greek, Hebrew, and in all the apparatus of Scripture histories, geographies, concordances, and "marrows," "bodies," and "sums" of systematic divinity, and concentrated all secular and theological knowledge upon the Bible. Nicholas Ferrar's mother, it was computed, heard 12,000 sermons. Prayers were sometimes an hour long; sermons ordinarily an hour, sometimes two or three hours, and there are instances of them as long as four or five. Philip Henry began at 9 o'clock on Sundays, and "never stirred out of the pulpit till 4 in the afternoon, praying, expounding, preaching, and singing." Ministers catechized publicly. They also "*taught* from house to house" in the parishes. (Cf. Acts v. 42.) Philip Henry declared (c. 1690) to students the one thing to study was the Scriptures; "be blind to everything else."

In the Grammar Schools. Boys had their Latin and Greek New Testaments, and in a few schools started the reading of Psalms in Hebrew. They learned Catechisms (these were almost universally learned, and there are said to have been as many as *one hundred* different kinds); "Histories of the Bible"; the Latin *Memoriale Biblicon*; summaries in verse; and accounts of the various parts in question and answer (one of the most famous being that of Eusebius Pagitt). The generally used colloquies of Maturin Cordier (Corderius) were permeated with Geneva puritanism, displaying the Scriptural atmosphere in the bringing up of children, perhaps better than any other document. The requirement that all grammar schoolboys should attend Sunday service was followed up by the regular demand on Monday to repeat the heads of sermons at least, and often the sermons themselves. It appears that the development of the teaching subject of shorthand was due to this requirement of note-taking of sermons. It should be noted that many of the old methods of the intensive study of the Scriptures insisted on the employment of self-active powers of the pupils: one great reason for their effectiveness. Not only at school, but at the University, tutors insisted on the study of Holy Scripture, of fathers of the Church, and of the stories of the Martyrs. (See J. B. Mullinger's *Cambridge in 17th Century*, Chaps. II, III.)

In the Home. Family prayers and religious exercises were as important, perhaps more so educationally, in the development of Puritan England than the school. Richard Sidgwick (1574-1643) would retire to a corner "mourning" religiously while the family were at games. James Bonnell (b. 1653) says he took delight in reading books of devotion at 10 years of age. James Usher (b. 1580), who became one of the greatest scholars of his age, learned reading from two sisters of his mother, who were blind from birth, and sought consolation in the daily study of the Holy Scriptures. John

Barwick (b. 1612), on coming home from Sedburgh for holiday, spent all Good Friday at church, when the other members of his family took an interval between morning and evening services. Still, all these cases are slight compared with the boy who had read the Bible through twelve times before he was 16 years of age.

The instances of the Scripture and religious home-training of girls is even more remarkable. The study of the Scriptures, and self-discipline in religious exercises, is the one great national educational experiment in intensive study attempted in England. It was due, historically, to the necessity after the Marian Persecution to be prepared to give a reason for the faith held by young and old, since each must hold such a conviction as to be ready to die for it. The Ferrar family, at Little Gidding, daily said, by memory, some portion of the Scriptures and parts of *Foxe's Book of Martyrs*. It is largely this fundamental belief in the sanctities of life—national and domestic, in the deep sense of the reality of goodness, justice, and self-discipline that has contributed to the individualism which has so largely aroused the national love of freedom and liberty. F. W.

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BIBLE IN ENGLISH EDUCATION, THE.—

Reading was customary during meals, according to the rule of St. Benedict; and Odo, Abbot of Clugni (A.D. 927), says that at his father Abbo's house, there was always the reading of the Gospel (S. R. Maitland: *Dark Ages* [1890], p. 336, 377). In 1517, it was prescribed in the Statutes by Bishop Fox, for Corpus Christi College, that a portion of the Bible be read "at dinner-time." Nevertheless, it cannot be said that the Bible was extensively read before the time of Queen Elizabeth. Bible-stories may have been learned by paintings on fresco, on canvas, and on glass, before the time of printing. The first large printed book was the Bible, at Mayence (c. 1451-1454), known as the Mazarin Bible, in Latin; but it was not till 1516 that the first Greek Text of the New Testament, together with a translation into Latin by Erasmus, independent of the Vulgate, was published. This Greek text of Erasmus served as a basis for Luther's translation of the New Testament into German in 1522, and of Tyndale's into English in 1525. In 1538 came the Injunctions of Thomas Cromwell, for the king, requiring a large copy of Coverdale's Bible (1535) to be placed in every church. In 1548 the *Paraphrases of Erasmus on the New Testament* were also required to be placed in every parish church, side by side with the English version of the Bible. In 1547 Winchester College was required by Commissioners to have the Bible "daily read in English,"

and all pupils were ordered to buy the New Testament in Latin and in English. But it was only after the return of the Protestant exiles from Geneva and Strassburg, etc., in 1558, that the religion of England became that of a book, and that book the Bible. The translation of the Bible made at Geneva in the editions of 1560, 1561, 1568, 1569, 1570, etc., made the concentrated reading of English Puritanism, and the Authorised Version of 1611, confirmed Bible-teaching up to the time of the Revised Version of 1885. The Bible was officially required as a school subject by the Canons Ecclesiastical of 1604 (in Art. 79). The tragedies of Smithfield and the Massacre of St. Bartholomew brought Puritan England to self-centredness in the Bible as the rule of faith; and much of seventeenth and eighteenth century English education is based upon the knowledge of the Scriptures, often in a verbal fashion, perhaps, which made the Bible the centre of real instruction to a degree never known before or since. Even the classical languages received much of their sanction, because the "holy" languages—viz., Greek, Latin, and Hebrew—were the original languages of the Bible. Statutes of schools (e.g., East Retford, 1552; Hartlebury, 1565; Rivington, 1566; St. Bees, 1583; and others) definitely require Scripture teaching. But it was the whole spirit of the nation, as it became mainly puritanic, that brought the Bible into its supreme position in domestic as well as in scholastic education. In the eighteenth century the Bible became a main feature of the elementary (charity) school.

F. W.

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BIBLE IN LITERATURE TEACHING, THE.—

Matthew Arnold, once one of H.M. Inspectors of Schools, was wont to insist, in his reports to "My Lords of the Privy Council," on the place which the Bible ought to hold in English schools. He urged that, besides the religious and moral purposes of Scripture teaching, it had a literary value of its own, and was the best instrument in the hands of the elementary teacher for refining and enlarging the thoughts of young children. The apostle of "sweetness and light" was, in the 'sixties, an object of deep suspicion; and the serious and solid British public regarded such a view of the Bible as only another sign of the flippancy of culture. But the last fifty years have seen a very great advance, both in the methods of Biblical criticism and in the general recognition given to views which, in Bishop Colenso's days, were dangerous heresies. Consequently, it is now possible to make a double use of Bible teaching. It remains what it always was: an incomparable training for the religious and ethical faculties, but it is also an admirable introduction to the study of all ancient literature.

The Making of a Book. To recognize, in the earliest of the Old Testament Books, the presence of diverse elements is no longer considered wicked or dangerous. Even conservative critics allow that probably no part of the Scriptures, as we now have them, was reduced to writing much earlier than the

6th century B.C. There is a tradition, without much evidence to support it, that Ezra the Scribe, on the return of the Jews from the Captivity, employed other skilled scribes to write from his dictation the twenty-four canonical books of the Old Testament, as well as many other books of sacred wisdom. Be this as it may, it is possible, from internal evidence, to disentangle in the Pentateuch four different kinds of narrative. There is the oldest of all, generally called J., because of the writer's frequent use of the name Jehovah; there is E., the narrative of the writer who uses Elohim; there is D., the author of Deuteronomy, with his solemn exhortations to the people of Israel; and there is P., the priestly editor of Ezra's day, who combined all the earlier narratives into a coherent whole, with special reference to the rites and ceremonies to be duly observed in the rebuilt Temple of Jerusalem. Though anything like critical discrimination between these narratives would be too difficult a matter for the young, it is easy to show them that the occurrence of two accounts of the same event—for example, the giving of the Law on Mount Sinai in both Exodus and Deuteronomy—point to the existence of more than one tradition, handed down, like all ancient tradition, by word of mouth. And young students can get their first lesson in ancient poetry by being shown where, for instance, in Exodus and Judges, the style changes from the narrative to the poetic in the story of Moses or the song of Deborah. Again, without going into all the controversial questions involved, it could be shown by comparing Kings with Chronicles how the love of mere ceremonial gained upon the Jewish Church, and how the message of the God of Israel, sent to his servants by the Prophets, "Bring no more vain oblations . . . wash you, make you clean; put away the evil of your doings from before mine eyes," was historically justified.

The light thus thrown upon ancient literature generally is in itself a valuable literary training, which has this advantage over the training given by the classics, that it has not to get over the language difficulty, and can be connected with the Bible stories told to even the youngest children. Of course, it is easiest in the case of the Old Testament; but even with the New, there is no great difficulty in explaining to children why the Epistles, which seem later, are really earlier than the Gospels. They can well understand that, as long as the Apostles were living who had known and walked with Jesus, they could bear witness to His life and His teaching; but that, when Paul had planted churches throughout the Roman Empire, the need arose for leaving with those churches a written record of the life and sayings of the Master.

The Training of the Imagination. Even before it is possible to deal with the Bible as a book, there is the Bible as a collection of stories—equal to any epic or saga in the world. These stories, just because they belong to the world's childhood, are, of all stories, those which have the most direct appeal to the child mind. They awaken wonder and interest and reverence in the natural way and in the natural order. Even those which are a stumbling block to their elders, because they conflict with later and more developed ethical conceptions (such as Samson's vengeance upon the Philistines, and his turning of the foxes with torches into the standing corn) present no difficulty to the child. Nor is he ever staggered by miracles;

how should he be, to whom life is one long miracle, one succession of wonders? It is a little difficult, therefore, to see the need which some people have imagined for a bowdlerised Bible—such a work as Mr. Montefiore's *Bibulum Innocentium*—at any rate, from the point of view of the "innocents" themselves, though it may be found comforting by their more sophisticated elders. But whether children are given the Bible as a whole, or a carefully prepared version of it, they should be given always the Bible's own words, because it would be impossible to exaggerate the influence which its language can have upon young and plastic intelligences. Indeed, the mere rhythm and beauty of the style sometimes works almost like a talisman. A nervous and excitable child, recovering by the seaside from an illness and waking in terror at the autumn winds, which sound to him like the Last Trumpet, could be put to sleep by nothing else but the reading aloud of chapters taken at random from the New Testament. This is no isolated instance. It is like the music played before Saul; it is the soothing effect of great art, the healing of the body through the mind by the beautiful and the familiar.

Methods of Bible Study. But to gain such influence, the beautiful must be the familiar; and herein lies the excellence of those methods of Biblical study, which, to some modern teachers, seem old-fashioned. The good old custom of reading a chapter, verse by verse, at the beginning of morning lessons is rare in modern schoolrooms; though, fortunately, the controversies roused by successive Education Acts have not yet deprived the elementary teachers of that morning Scripture lesson, which, as Matthew Arnold pointed out, is their great opportunity. Reading and re-reading, the learning by heart of special psalms and parables and selected passages of Scripture—all those "religious exercises" and "Sunday occupations" of mid-Victorian childhood—did store the mind with Bible phrases which exercised a deep, if unconscious, influence upon literary taste as well as upon character. Long before they could be reasoned about, certain texts had become an inalienable heritage; and, to one child at least, that fine saying of the greatest of the Hebrew patriarchs: "Shall not the Judge of all the earth do right?" has remained as a sure consolation in all the changes and chances of later life. It is only by frequent reading and recital that the words of Scripture become really part of our mental furniture; and such reading and recital must begin at an early age, the age when learning by heart is all the easier, because reasoning on what is learnt has hardly begun.

Moral Training. Once acquired, the phrases stay. They are unconsciously digested. And when the teacher comes to their moral significance and wishes to apply them to the problems of life and character, he finds that the work is half done already. For, almost unknown to himself and certainly quite unknown to those about him, the child has imbibed the spirit of the Old and New Testaments. The Old Testament has given him the conception of the righteousness of God. From the story of the Creation downwards, the lesson of the Old Testament is that the wages of sin is death; that, even if the ungodly seem for a while to prosper, later, when a man passes by, their place is no longer to be found. It is the keynote of Jewish history; when the people sin against

Him, the Lord hides His face in wrath and they go into captivity; when they repent, He relents and showers upon them His manifold blessings. With the Prophets the note struck is the need for true repentance, for spiritual religion. Therefore, for older children, a more definite ethical teaching can be based, for instance, upon Isaiah. But even the very young can understand something of the loving-kindness of the Lord, "gracious and full of compassion"; and can connect the Messianic prophecies with the stories of the Gospels, whose keynote is that love is the fulfilling of the Law. The three first Gospels need only to be read; for children, they need no expounding. The Epistles are, perhaps, more alien to the child mind; but even children can be impressed, not perhaps by Paul's doctrinal subtleties, but by his magnificent confidence. "I have fought the good fight; I have finished my course; I have kept the faith. Henceforth there is laid up for me a crown of righteousness, which the Lord, the righteous Judge, shall give me at that day: and not to me only, but unto all them also that love His appearing."

And this brings us to the last element in Biblical teaching—the mystical element—sometimes deprecated in education, but surely of unquestionable value as a training in "otherworldliness." All imaginative children are fascinated by the Apocalypse, or the Revelation of St. John the Divine. They can be roused to something like an ecstasy of emotion by the mere sound of such sentences as: "I am Alpha and Omega, the beginning and the ending, saith the Lord, which is and which was and which is to come, the Almighty." And though, if pushed to excess, such excitability has its dangers and may end in the faith which believes "because it is incredible," it is also evidence of the spirit which makes saints and martyrs, and of the sensibility without which there can be neither poetry nor art. It is not, therefore, to be neglected as an element in education, even if it needs to be used with caution. Many children want teaching how to feel quite as much as how to think. But just because feelings are sensitive plants and can bear no direct touching, we should set infinite store by the indirect training afforded in these visions of glories which "eye hath not seen, nor ear heard, neither has it entered into the heart of man to conceive." And if it is objected that mystical contemplation is a hindrance to action, we may reply that action uninspired by imagination is apt to be too short-sighted to attain to great ends. In any case, as the Greeks said, "few are the mystics," so that the danger of excess is infinitesimal; whilst many are those who, for lack of this early training, plod along the dusty highways of the world without knowing how to raise their eyes to the hills, whence might come their help. (See MYSTICISM AND EDUCATION.)

This brings us to the conclusion of the whole matter. In a sense, it is a paradox to talk of teaching literature at all, for literature cannot be taught—it can only be felt. All that the teacher can do is to train the artistic sensibility, which can discern good from bad and prevent the growing boy or girl from confusing literature with printed matter. That is why literary text-books are an abomination, as well as a delusion and a snare. But just because, for the reasons imperfectly set forth within the necessary limits of an encyclopaedia article, the Bible does place in the hands of the teacher an unequalled instrument for training

the imagination and the emotions, it affords him his best opportunity for awakening in his pupils the capacity to appreciate great literature.

W. L. C.

BIBLICAL INSTRUCTION IN SCHOOLS.—The most moderate critic now admits that we must profoundly change, in teaching the Bible, the methods of our grandfathers. Educated people who still accept the Bible as something more than literature, have given up regarding it as a mere storehouse of isolated texts or even passages written to prove their own special theology. We no longer go to it as to an infallible authority on history, geography, or science. We no longer look on it as containing equal ethical or spiritual value on every page. We have had to surrender the old view of an inspiration that demanded an unquestioning assent to all that is in the Book from cover to cover. This was never an easy thing to believe; but, once believed, it was simple to teach.

The Teacher. No one can thus offhand to-day undertake the responsibility of Biblical instruction; he has to make up his mind what he is going to teach; he has to make clear essentials to himself. He has to make clear to himself that the Bible is a literature, not miraculously guarded from the human accidents that accompany the growth and handing on of all literature—accidents of copying and editing. He has to teach himself the history of this growth and the effects of these accidents in transmission. But this is mere framework; it is the picture within the frame that is the thing of value. The teacher has to make clear to himself the meaning of the literatures. Just as in music the air may persist in endless variations, so there may be a spiritual witness in literature, growing clearer, rising and falling, but, on the whole, advancing—like the ebb and flow of a tide. This is what is meant by an inspired literature. We cannot define the precise limits of inspiration—its effect is spiritual, not mechanical—and, if the teacher can trace in essentials this witness to religion and the growth of it in the human literature, he has, indeed, something to teach. The historic growth may at last be communicated to an inquiring or teachable mind; but the essential thing to teach is the moral and spiritual witness of the literature, and its progressive character.

Method of Teaching. But what is the measure of apprehension that the teacher has to deal with? The teacher has, if I may say so, first taught himself; who is the pupil whom he has next to teach? It is to the mind of the young that the meaning of this Divine literature has to be brought home. Now, firstly, it is a dangerous thing to teach authoritatively to the young, for the sake of immediate peace, anything that must some day be unlearned. By such a method you are laying up a certain store of religious trouble. The young mind is single, open to authority; and any authoritative teaching of a theory of inspiration that is bound to clash with Bible facts, simply and sincerely regarded, is sure one day to be a ready parent of scepticism. Secondly, mere theories have no interest for the young. If this be avoided, and no false standard of judgment be set up, it is comparatively easy to teach the permanent and essential truths of religion to a receptive mind. It is true that this method is equally likely to induce questions, but that will give the opportunity of distinguishing the picture from the frame—the essential from the non-essential.

The ancient form will be questioned in moral detail. Jacob will appear crafty and David cruel; and that is the moment in which it can be pointed out how all advance has been gradual. The great lesson of God's condescension can be illuminated by the difficulty itself. Thus, honestly dealt with, the young mind finds no difficulty. That, then, must be the secret of success: to teach the history as you would any history, but the religious lesson of the Old Testament as *more or less* akin to the Christian standard. The teacher must work on an eclectic method; he must grade his lessons by the children's capacities. The records of Christ's life and words, the simplest of His parables, should come first. *Pari passu*, any part of the Bible that gives the simplest thoughts of God, Creator, Father, Deliverer, Who chose Israel for His people, can be well given. Let the thought and standard of Christ be established in the child's mind; then enter on a fuller teaching of the Old Testament. This once done—the stories of the Master's life once told—you have something to work from and to. You must, while still extending your teaching, be guided by the child's love of story. The tales of the Patriarchs, of the Judges, of Samuel, Saul, and David are of inexhaustible interest and beauty. Whatever is noticeably less than Christian, you need not fear to tackle, so long as you have not given false theories of inspiration and authority. So long as ever you are taking care to lay deep in the receptive mind the simple truth of progress—of what we call evolution in religious knowledge, of Divine condescension—it will not be upset. The child's growing experience reveals the same truth to it. You will have this method at the back the whole time; and the child, being aware of its own past growth in knowledge, will trust in such teaching. You will soon teach the mind of the elder to understand that truth is not all after the fashion of Mr. Gradgrind; that there is truth in fable, in folk-lore, in poetry, even in honestly-told, but not always accurate, history. Later, you will readily be able to show your older pupils what the Bible is: its conditions of origin, of gathering, of editing; the difference between the literature of a nation and the literature of a Church. Under such leadership, the older minds will learn to distinguish between the soul and the body of the Bible. "Thus," they will say, "is the highest level to which such or such an age reached. This is not even as high as that. This is what the more primitive folk found a way out of. God has led us further still."

Never attempt to give them a strictly chronological life of Christ. It cannot be done. The Gospels are not histories: they are memoirs; they are a series of typical pictures out of a multitude of unrecorded details; they are best taught as such.

Lastly, you can, if you have faith and are tactful, touch even to the elder children on the real Biblical difficulties; e.g., the re-writing of history by the chronicler, under a misconception of the past; the growing exclusiveness of the post-exile Jew; the difference between much of the miraculous in the Old Testament and the New Testament; the fierceness of some of the best of the later Psalms. These points, compared with the elucidation of the growth of essential religion, may be secondary; but it is desirable that youthful minds should not go out into the world and hear all this from a hostile side.

The Grading of Instruction. Roughly speaking, give the stories of the Bible to the younger mind;

to the more mature, the meaning and growth of the teaching of the prophets will appeal. In the New Testament, where the character of Christ's life and its issues have been taught, the message of St. Paul should answer to the prophetic element of the Old Testament, and then the teaching of St. John. This may be impossible outside a secondary school, but there it can certainly be done. I am not speaking of difficult dogmatic theology, but of the broad difference between the Gospel and the Law, and of the fulfilment of all law in love.

Further, it should be shown to older students, by reference to the last chapters of most of St. Paul's Epistles, what early Christianity meant in life itself.

I am, of course, assuming that the teacher is bent on making for himself the best possible selection for teaching religious truth from the Bible, while not effacing it as literature; and, therefore, that he will take all possible pains to teach himself what the Bible is; how it grew over a thousand years; what elements it absorbed; how it was treated in its long growth; what influences decided to limit it. Happily, for this hard work there are many excellent handbooks, all by men who sympathize with modern teachers' difficulties.

It is well known that it takes a skilful theologian to write a good Catechism: so it takes a thorough Biblical student to teach the Bible to the young in the best way; not because such a student will set out to teach the young what his own maturer mind has grasped, but because the well-instructed mind alone knows the essential points, how best to await and solve the child's questions, and, most important of all, how *not* to teach what is certain eventually to create a serious stumbling-block. It has been often truly said that "he who teaches, learns": it is nowhere so true as for teaching the Bible that "he who desires to teach, should first learn."

T. C. F.

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BIBLIOGRAPHICAL INSTRUCTION. — The object of such instruction is to enable teachers and students to obtain an understanding of the use of books and libraries. A knowledge of the range of text-books in any subject, of the methods of conducting libraries, and of the principles underlying the construction of bibliographies, encyclopaedias, and library catalogues, is most valuable to readers and research students. Instruction in these subjects is systematically provided in some of the universities and high schools in America.

BI-LINGUAL SCHOOLS IN CANADA.—There is no provision in the law or regulations of the provinces of Prince Edward Island, New Brunswick, or British Columbia for teaching any language besides English in public elementary schools.

Quebec. The Treaty made with the people of the province of Quebec, when it became a British possession, permitted the French to use their own language in the elementary schools. Of course, the English language is used in schools established for English-speaking children. There are, therefore, two distinct systems of elementary schools: one for French children, and the other for English; but neither is bi-lingual.

Ontario. The law and the regulations of the Department of Education make it clear that the teaching above Form 1 in all schools must be in English. Even in Form 1, the children must begin the study and use of English immediately. In the English-French schools, bi-lingual readers may be used. French may be taught as a subject of study, but the teaching must be in English. They are inspected by two inspectors.

Manitoba has a large number of settlers from many foreign countries. Forty-two per cent. of the population is foreign, representing some twenty different nationalities. Until 1916, the law provided that "when ten of the pupils in any school speak the French language, or any language other than English as their native language, the teaching of such pupils shall be conducted in French, or such other language, and English upon the bi-lingual system." As the population increased, this law naturally proved unworkable. In a school of forty there might be four "nations," each consisting of ten pupils, none of them English; the law provided that they were to be taught in English and in four other languages. The law also prevented the training of a united race of loyal Canadians. Some foreigners even objected to their children singing "God Save the King" at the opening exercises, though most recognized the wisdom of having their children taught the language of the country in which they were going to reside. Four classes of bi-lingual certificates had to be issued, in addition to the ordinary certificates of English teachers, viz., French, German, Polish, and Ruthenian, all teachers alike having to be able to use English. Four sets of bi-lingual text-books were required, printed in English and one of these languages. It was, therefore, decided to repeal the bi-lingual law.

Alberta and Saskatchewan have the same law: "All schools shall be taught in the English language, but it shall be permissible for the Board of any district to cause a primary course to be taught in the French language."

Nova Scotia has no law with regard to the language of the teaching, but the regulations provide for training bi-lingual teachers for French-speaking districts.

J. L. H.

BILINGUALISM.—In considering bilingualism, we should distinguish between its two forms: (1) When different languages are spoken by different sections of the population; (2) when they are spoken by the same person. The term bilingualism thus has both a social and an individual application. Let us examine the former case.

Bilingualism in its Social Aspect. When a people speaks two languages which are related to each other (e.g., Catalan and Spanish), the resulting

difficulties are trifling. The speakers understand each other quite easily. But the problem presents itself in a form which may fairly be described as acute when the two languages are of different families (*e.g.*, Welsh and English in England, or Flemish and French in Belgium). In this case, the conflict of tongues always cloaks, if it does not express, a conflict of races. The struggle is not confined to linguistic rivalry. Politics is often mixed up with it; religion is involved; all kinds of interests are entwined about it. All this indicates that the means of comprehending and estimating realities, expressed in words, differ profoundly in different races. The cause is not the language; it is the essential spiritual difference between different human aggregations. Nevertheless, since language is the one and only comprehensive and precise vehicle of thought, it is the language that is blamed for these divergencies. Some say: When a people has two languages which are the expression of two distinct races, emulation between the national groups is favourably influenced thereby. Each group tries to dominate the other; its work thus becomes stronger, its efforts more abundant and more thorough. Contradictory qualities are needed for the complete understanding of certain things; their contrasting aspects are more clearly realized. Moreover, often in doing the same work, the two races agree. Then a profound harmony comes into being, hitherto unknown.

Others say: If the soul of a people is so complex that two currents meet to form it, that soul will be thereby only more original, if not more beautiful. In art, for example, where great liberty can be accorded without any danger resulting, the facets of beauty sparkle the more brilliantly, the more boldly qualities of almost opposite characters throw them into prominence, and give them lustre and transparency.

The school of Flemish painting may be cited in support of this. The brothers Van Eyck, who were of Flemish origin, laid its foundations and impressed upon it its guiding lines. Thanks to them, it sprang up amidst a people whose genius they expressed through their own genius. The characteristics of this art are fullness and sanity. It developed with strength and placidity. It is materialistic, so far as religious art can be materialistic. It expresses spiritual delight through a sort of tranquil, expansive, sensual delight. This art has not much sensibility. In it neither anguish nor passion is to be found. It does not even make a decided appeal to the intelligence. It is merely agreeable and personal.

Then came Roger Van der Weyden. His real name is Roger de la Pasture. He was a Walloon by descent, and was born at Tournay, in Hainaut. He accepted all Van Eyck's teaching, just as Hans Memling, who came to Bruges from Germany, accepted it. Now, it happened that these two foreigners, laying hold of Flemish painting, made it their own and left it the most perfect school of painting in the North of Europe. If Memling introduced more sweetness of expression, Roger de la Pasture brought in passion and drama. He delighted in crucifixions and entombments. The Virgin, Christ, St. John—hitherto simply grave and majestic personages—became now pathetic and expressive actors. Sorrow and suffering were depicted. The entire gamut of profound emotions was sounded—so much so, that thenceforth Flemish painting became the painting of humanity. That is one of the best instances of what might be called

contradictory contributions to the same work. It proves that what two races bring to a single undertaking may not merely keep the unity of the work intact, but may even strengthen and fulfil it gloriously.

You may say that in this case it is not so much a matter of difference of language as of difference in conception. I admit it, and the more readily because, to my mind, a difference of idiom and a difference of conception are, at bottom, one and the same thing. It is not the difference of the sounds that matters in bilingualism: it is the difference of the thoughts of which these sounds, as a whole, are the expression. We have just been examining a happy contribution of two different efforts applied to the same object. It is unnecessary to add that this double effort often results in failure. Not to leave the domain of painting, let us dwell on the non-success of certain Flemish painters who tried to do Italian painting. Over there, beyond the Alps, Calvaert brought nothing new or effective to the art of Bologna and Rome; nor here, in Flanders, did Floris succeed in galvanizing the school of Antwerp with his Italian importations. No fusion was made; he failed in all his attempts. Fortunately, Rubens came after him and put back everything in its place. That was a stroke of genius.

Apart from questions of art, the contradictory collaboration expressed by bilingualism becomes more dangerous, both in the realm of politics and in that of society. There is no doubt but that languages spoken solely by little peoples or fractions of great peoples put the provinces that use them in a position of inferiority. Great streams of universal thought do not pass through them. If, in the name of liberty and variety, one must defend the right which little peoples claim of speaking their own idiom, one must labour harder and harder to make them understand that their most urgent interests require them to learn and practise a less restricted manner of speaking. Their emotional life may, if need be, find expression in a dialect, but their intellectual life should strengthen itself with the knowledge and use of a universal language.

A man must distinctly regard himself as dependent not merely on his district, but on his country. Now, his country has a strong, subtle individuality, which is due neither to language, religion, nor political institutions. All these are under its domination. I venture to say that it is, above all, an idea which lasts throughout time, and, though changing externally, remains all the while the same within. It is made up of memories common to the same people; it is the expression of an attachment which grows stronger and stronger the more it comes to be instinctive. It is time, rather than language, religion, or government, that makes the country. When people have lived together for ages of glowing life, not a foreign yoke, not new interests, not even greater advantages can ever destroy national sentiment. It possesses the inert vigour of a habit. Belgium is a young nation; it might have been doubted whether she would be true to herself. Germany forgot that Belgium already had eighty years behind her when she attacked her. Poland is an old nation; 150 years of foreign domination have failed to overcome her individuality. Armenia is an ancient nation. Her thousand years of existence protect her completely against absorption. A nation dies only through depopulation or extinction.

To decide whether a country is a nation or a mere agglomerate, it is sufficient to note how its people fight. The war proved that Belgium is a nation and that Austria was not. In both countries different languages are spoken, but in the former, in spite of this diversity, the national idea is full of life; in the latter it is languid. Belgium has been welded by time into a natural state of unity; Austria is a mere collection of states which time has not consolidated and which remain in an artificial state of union.

Bilingualism and the Individual. From the point of view of the individual, bilingualism seems to present nothing but advantages. The only apparent inconvenience regards the professional writer. When asked if he was studying English, the poet François Coppée answered: "I learn French every day." The reply was that of a true man of letters. A perfect mastery of any language is indeed the business of a lifetime, just as for an artist is the knowledge of drawing. The great Japanese painter Hokusai said, at the age of 80: "I am just beginning to have a notion of what a brush-stroke is." To write in two or more languages is of use only to people who take no pride in writing perfectly in one or other of them. The languages are not hostile to each other, but the delicacies and niceties of expression are in perpetual conflict. You must not allow the most delicate ways of thinking to interfere with one another. You must make a choice among them, and stick to the choice you make.

Languages are learned easily in childhood. The grown man delights in surrounding an object with synonyms. The child searches different languages for as many words to designate a thing as his father collects in his native tongue. Only, the child forgets just as easily as he remembers. At 5 or 6 he could express himself in three languages; at 15 he can express himself only in his own language, having lost the use of the other two. The gift of tongues bestowed upon him must, therefore, be made lasting. Nay, more: it must be strengthened. At college, as instruction is given only in a single language, the overloaded memory, in order to provide accommodation, treats all its old burdens as so much ballast. It becomes fuller in one part, but is subject to loss in others. To prevent this waste, what it acquires should be presented to it not in one, but in several languages. Might not geography be taught in English, history in French, and other subjects in the vernacular? Since the commerce of all nations tends to become more and more universal, why not adopt English, the language of general exchange, in teaching it? Why not teach a clear and exact science like mathematics in French? Thus young intelligences might be equipped advantageously, even if their instruction were carried on simply in the land of their birth.

Yet it is to be hoped that the young people of a country will exile themselves for a time in order to complete their education, and that exchange of children between families in neighbouring countries will grow more common. Whether one be English, French, Belgian, Spanish, Russian, Italian, or German, one must think more and more about Europe as a whole, of which the several nations would be so many provinces or departments. In spite of wars, some day the United States of Europe must come into existence. The problem is to find the best means of bringing this about. Federation

will always be better than absorption, especially as it is important to preserve in its integrity each individual contribution. To neglect or stifle any of them would be a crime.

When a child's intelligence unfolds before two languages, which of the two is its native tongue? Is it the one spoken in its province, or is it the one it speaks at home? In middle-class families, especially at Brussels, the children are brought up to speak French, although the people of North Brabant speak Flemish. I should say that in this case the native language is the one spoken in the child's family. How could it be otherwise, when many Brussels children only learn Flemish very late, and when that, too, is far from being pure Flemish?

Such are the reflections suggested by the urgent and interesting question of bilingualism. I apologise for taking my examples chiefly from Belgium. I have done so simply because, of all bilingual countries, this country is the one I know best.

E. V.

BINAURAL HEARING.—Each of the ears has the power of transmitting sensations to the brain, but they are combined to form a compound organ, and the perception of sounds is the result of the union of two sets of sensations. If the sensation of sound is greater on one side than another, the resulting perception indicates that the source of the sensation is on that side. The sensations are often so evenly balanced, however, that the hearer is unable to locate the precise direction, especially if the sounds come from the direct front, rear, or overhead.

BINET, ALFRED (born Nice, 1857; died Paris, 1911).—The foremost French experimental psychologist of his time and the pioneer in those paths of research which render the greatest service to education. From the outset of his career, his main preoccupation was the study of intelligence, particularly as it manifests itself in the higher mental processes, underlying all of which he suspected (what Professor Spearman has recently proved to be the case) the existence of a fundamental ability, or common factor—now known as general intellectual energy. Having studied Natural Science, Medicine, and Law at the Sorbonne, he published a series of writings which not only show his strong bent towards psychological questions, but also prove the comprehensiveness of his interests and his prodigious capacity for work. His earliest book, *La psychologie du raisonnement* reveals the influence of Mill; while in *Le Magnétisme Animal* and *Les altérations de la personnalité*, written in collaboration with Feré, it is easy to trace the influence of Charcot and the pathological studies of the Salpêtrière. Studies in animal psychology and physiology, such as *Sur la vie psychique des micro-organismes*, and his thesis for the doctorate: *Contribution à l'étude du système nerveux sous-intestinal des insectes*, were the expression of his activity in another direction. In 1894 he was appointed director of the laboratory of physiological psychology at the Sorbonne, and for nearly thirty years, this laboratory was the focus of experimental psychology in France. Binet gave no set course of lectures; but his fertility of ideas made him an unfailing source of suggestion to the students, whose research he directed, and whom he inspired with his belief in the value of accurate experimental

work. At a time when the German school of experimental psychology, with the help of elaborate apparatus, was investigating the simpler elements of mental life, Binet, with the aid of "a pen, some paper, and much patience," was fruitfully studying the concrete phenomena of memory, attention and imagination. The wealth of experiments devised by him were of the simplest character, but they yielded a rich harvest of knowledge, owing to the experimenter's skill in guiding and elucidating the introspective account of the individual subject. The important place assigned to introspection is an essential characteristic of Binet's method of research. His comprehensive work, *La suggestibilité*, and his many contributions to *L'année psychologique*, which, in collaboration with Beaunis, he founded in 1895, amply illustrate this method, the far-reaching results of which were made fully evident in his epoch-making work, *L'étude expérimentale de l'intelligence*. This book contains a remarkable record of the experimental study of the mental processes of two girls of contrasting types. In the face of his data, Binet could no longer hold the view that thought was due to an interplay of images, for it seemed evident to him that it was essentially a directing and organizing force, in no way dependent on the imagery, which subserved its intention. Education owes even more to this book than to his later work, *Les idées modernes sur les enfants* (1907), in which he surveys the educational field, showing what conclusions have been established, and what gaps still remain for research to fill. He himself was engaged on one of these—the diagnosis of the aptitudes of children—when death overtook him.

The Binet-Simon Tests. Shortly after the publication of *L'étude expérimentale de l'intelligence* (1903), Binet was called upon to suggest a means of diagnosing mental defect. He threw himself into the work of devising suitable tests, based on psychological knowledge; and, after experimenting with these on hundreds of children, he produced, in 1905, the first scale for the measurement of intelligence. Composed of a series of tests of increasing difficulty, the scale, from the outset, proved a successful instrument for the discrimination of the mentally defective. Its author soon determined to extend its use to the measurement of the level of mental development of normal children. With the aid of Dr. Simon, he examined a very large number of children in the primary schools of Paris, and standardized the tests relatively to their capacity. The scale aroused immediate interest, and it is, no doubt, through it that Binet is so widely known. Well aware that his bold invention was far from being a perfect instrument of measurement, he never ceased to work for the improvement of the scale, and to welcome and utilize criticism and suggestion. A few months before his death, a second modification of it was published. Since then great progress has been made both in the construction of mental tests and in the interpretation and evaluation of their results; and while the Binet-Simon scale will always rank as a pioneer effort in a new direction, it is probable that internally graded mental tests will, eventually, replace it. One of the first practical effects of the Binet-Simon scale was the establishment in Paris of special classes for "backward" children. Binet felt that, with special methods and greater individual attention, much might be done for children suffering from slight mental defect; backward

children, who, competing in large classes with brighter comrades, tended to become discouraged and apathetic from constant failure. Binet devised methods and selected the material and teachers for these children, who, gathered into small classes, seemed to brighten into new life. Many of them, with self-confidence restored and a habit of work acquired, have been able to return to the ordinary school. Binet, by opening a pedagogical laboratory in one of the schools, and by presiding at the fortnightly discussions of *La Société libre de l'étude psychologique de l'enfant*, did much to awaken and sustain an interest in child-study among primary teachers. The *bulletin* of the above-named Society shows how assiduously its president worked at school problems, and his frequent collaboration with teachers was a service to education, since it showed that, under the expert guidance of the psychologist, the teacher could contribute his part to pedagogical research.

Thus Binet played a leading part in the establishment of the new pedagogy, which, in his words, "*doit être fondée sur l'observation et l'expérience . . . doit être, avant tout, expérimentale.*"

N. G. R. T.

BINOCULAR VISION.—When an object is looked at with each eye in turn, a separate image is formed on the retina of each eye; but the two images are not precisely alike, because the two lines of vision do not coincide. On looking at the same object with both eyes, one image is perceived and, if vision is perfect, the slight differences are not noticed. A common defect of vision causes an imperfect union of the two images, and a blurred image is seen with outline indistinct or having the appearance of two outlines. The value of the union of two retinal images lies in the fact that it enables us to perceive solidity, while for the more perfect combination of the image the stereoscope is used. This instrument produces in each eye the image it would naturally perceive if looking alone at the object, and the combination of the two images gives one perfect perception of solidity.

BINOMIAL THEOREM.—In Algebra, a binomial expression has two terms of the form $(p \pm q)$. The binomial theorem was discovered by Newton, Briggs, and Pascal, and proved by later mathematicians. It provides a means of writing down any power (positive or negative, integral or fractional) of a binomial expression by means of the following formula, which is to be taken as true for all values of p , q , and n —

$$(p + q)^n = p^n + n p^{n-1} q + \frac{n(n-1)}{1 \cdot 2} p^{n-2} q^2 + \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3} p^{n-3} q^3 + \text{etc.},$$

in which the general term, if n is a positive integer,

$$\text{is } \frac{n!}{m! (n-m)!} p^m q^{n-m}$$

BIO-CHEMISTRY.—(See CHEMISTRY, THE TEACHING OF ORGANIC.)

BIOGRAPHICAL RESEARCH.—(See RESEARCH AT THE BRITISH MUSEUM AND PUBLIC RECORD OFFICE, THE APPARATUS OF.)



MAT MAKING



BOOT AND SHOE MAKING AND REPAIRING

Training Blinded Soldiers and Sailors at St. Dunstan's Hostel, Regent's Park, London

PLATE XII

BIOGRAPHY.—The oldest history was biography, and the historical parts of the Bible consist largely of the lives of men. Homer's epics, Virgil's *Aeneid*, Plutarch's *Lives*, and numberless other works of like character down to the present day indicate the fact that the living interest of history lies in the actions of men. In the schools of Greece, Rome, and mediaeval Europe, biography was largely used as a means of teaching history. In present schemes for the teaching of history, biography usually has a prominent place. The first lessons are generally stories about historical characters, especially young persons or those whose lives contain incidents appreciated by the young. This interest in the living person is also aroused by biographies of imaginary beings personifying ideas and objects connected with other branches of instruction. In some methods of teaching reading, even the letters become living beings and talk to each other, the fairy tale is a life-story, and the plastic model of an animal or a flower does not remain a dead thing, a biography being invented for it. In the higher branches of teaching, much history is learnt by the study of lives of great men and women. The advantage of securing the living interest is, however, somewhat nullified by the danger of losing a sense of proportion, and of treating the man as the only, or the most, important part of his age. If biography occupies too large a part in the teaching of history, many facts and many of the great lessons of history are lost.

BIOLOGICAL LABORATORY, THE. — (See LABORATORIES, THE EQUIPMENT AND ARRANGEMENT OF.)

BIOLOGY.—(See PHYSIOLOGY, THE TEACHING OF.)

BIOMETRIC METHODS.—(See HEREDITY.)

BIOMETRY.—This may be defined as the application of exact statistical methods to biological problems, in order to enable us to advance from the qualitative to the quantitative expression of biological facts and relationships; for, in the words of Lord Kelvin, "when you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind." Biometry owes its inception to the work of Sir Francis Galton (*q.v.*), who, realizing that the problems of heredity were in the main statistical in character, set himself to collect the necessary *data* and to devise methods for their interpretation; but its development is almost entirely due to Professor Karl Pearson, who, in a long series of memoirs published principally under the general title of *Mathematical Contributions to the Theory of Evolution*, has laid down the fundamental methods of modern statistical analysis.

The primary function of Biometry is descriptive. In the first place by the mean or average, the standard deviation, the coefficient of variation, etc., and by the fitting of a standard series of curves to frequency distributions, it provides means of describing any group of observations by a series of statistical constants; secondly, by means of the correlation coefficient, the correlation ratio, etc., it enables us to measure the relationship between groups; and, thirdly, by the probable error, it

provides a method of assessing the probable accuracy of any statistical constant.

In addition to obtaining the average or mean of any series of observations, it has been found of great importance to test the variability of the observations by the standard deviation, and also to examine how closely the observations follow one or other of Pearson's well-known type curves, which have been found to describe with reasonable accuracy practically all homogeneous series of observations.

The Correlation Coefficient, which is used to measure the closeness of the relationship between groups, may range from zero to unity, being zero when there is absolutely no relationship between them, and unity when the relationship is one of cause and effect. To take a few examples, the relationship between right and left femur in man is measured by a correlation coefficient of .98, practically unity; that between vaccination and recovery in cases of smallpox is expressed by a correlation coefficient of .60; while that between length and breadth in a certain series of skulls was found to be .05, or practically zero. To look at these coefficients in another way, the relationship in the first case is so close that, given the length of the right femur, we can predict almost exactly the length of the corresponding left femur. On the other hand, in the particular series of skulls dealt with, a knowledge of length gives us no assistance in predicting breadth.

The correlation coefficient may be either positive or negative. If positive, it indicates that, as in the case of right and left femur referred to above, the variations tend in the same direction; if negative, it indicates that they tend in opposite directions. Thus the correlation between the birth-rate and the standard of comfort in the Metropolitan boroughs of London, as judged by the number of domestic servants per 100 females, is -.80, indicating that where the standard of comfort is high, there the birth-rate is low, and vice versa.

These examples are all taken from quantitative *data*; but various ingenious methods have been devised by which comparable coefficients can be obtained in the case of qualitative *data*, such as eye colour, presence or absence of disease, mental capacity, etc.

Probable Error. The need for the determination of the probable error of any statistical constant arises from the fact that, in practice, we can usually obtain measurements only of *samples* of populations. The means, correlation coefficients, and other statistical constants will, of course, vary from sample to sample; and hence the variation in those constants for an indefinitely large series of samples must be obtained so as to determine what weight must be given to a constant obtained from any particular sample, and this is done by the probable error. It is obvious that this will, in the first place, depend on the size of the sample, for the greater the number of observations, the narrower will be the limits within which statistical constants obtained from the samples will vary. The probable error of a

mean is $\frac{.67\sigma}{\sqrt{n}}$, where σ is the standard deviation of the series and n is the number of observations in the series. The probable error of a correlation coefficient is $\frac{.67(1-r^2)}{\sqrt{n}}$ when r is the correlation coefficient and n , as before, is the number of observations in the series.

Biometric methods were, to a large extent, devised in order to place the study of heredity upon a sound statistical basis; and the following table gives the correlation coefficients measuring the intensity of parental inheritance in man for various physical, psychical, and pathological characters—

Character.	Authority.	Correlation.
Stature	Pearson & Lee	·49 to ·51
Span	Pearson & Lee	·45 to ·46
Eye-colour	Pearson & Lee	·44 to ·55
Intelligence (based on Oxford Class tests)	Schuster & Elderton	·44 to ·54
Pulmonary Tuberculosis	Pearson	·40 to ·60
Deaf Mutism	Schuster	·45 to ·62
Insanity	Heron	·52 to ·62

These results, which are based on numbers which make the probable errors very small, show that while the intensity of inheritance varies slightly from character to character, it is definitely significant in each of the cases given, the coefficients being about half-way up the scale of correlation. Various applications of biometric methods are to be found in *Biometrika* (see References), and in the publications of the Galton Eugenics Laboratory and the Biometric Laboratory, both located at University College, London, under the direction of Professor Karl Pearson. D. HERON.

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BIRD LIFE.—If the outdoor study of bird life is to develop along really educational lines, attention should first be directed to the birds that haunt the house and garden; and the outlook gradually extended to include successively those of the orchard, the fields, the river valleys, the woods, and the countryside generally. Even at this early stage, the first year's observations will provide material for a first general classification of the local birds into: (1) Residents (*e.g.*, the blackbird, skylark, and peewit) to be seen or heard all the year; (2) summer visitors (*e.g.*, the cuckoo, swallow, and nightingale) which come for the summer only; (3) winter visitors (*e.g.*, the fieldfare and redwing) arriving in autumn and staying the winter only. As observations accumulate, opportunities will arise, especially in districts near the coast or the migrational fly-lines, for including the two further categories, viz.: (4) Birds of passage (*e.g.*, the Greenland wheatear and white wagtail), which simply pass through our islands in spring and again in autumn; (5) occasional visitors (*e.g.*, the rock thrush and sand grouse) which are frequently driven to our islands by stress of weather or other accidental circumstance. Fortunately, this classification is constant throughout the British area, and such observations continued will ultimately provide a complete and properly classified list of the birds of the district: this may yield valuable information regarding the fauna of the country as a whole.

To compare the local bird fauna with that of

Great Britain, the following authoritative table, published by the British Ornithologists' Union, should be noted—

Residents	141 species
Summer Visitors	47 "
Winter Visitors	46 "
Birds of Passage	30 "
Occasional Visitors	210 "
Total	474 "

How and What to Observe. Concurrently with the preparation of this key list, attempts will be made to record observations on the various activities which make up the habits of the most accessible birds. Thus the varying habits of successive seasons may be compared for the same and contrasted for different species; all should also be correlated with the environment—the presence or absence of woods, hills, rivers, man, temperature and climatic conditions generally—upon which the seasonal behaviour and movements of birds so vitally depend. Such observations would include records of the situations which the different species select for food, shelter, or sleep; whether the species is sociable or solitary; the characteristics of its flight and of its pedal locomotion; its means of communication, whether by simple call notes, alarm notes, or true song; its plumage: (a) time of moulting, (b) relation of this to its period of greatest activity, (c) relation of this to surroundings, (d) seasonal changes, if any, (e) and any characteristic differences between male, female, and young. As spring merges into summer, energy and vigour increase to their maximum, and find expression in (a) the great migrations, (b) increased brilliancy of plumage, (c) great outburst of song, (d) building of nests and care in bringing up the young. Here the birds'-nesting instinct may be resolved into educational elements by training boys to record observations upon the nesting haunts, the actual site and materials of the nest, the eggs, etc. Thus, a fairly approximate life-history of a species would be obtained; and any pupil or class which had prepared the best possible history, say, of the blackbird, wren, blue tit, pied wagtail, swallow, skylark, jackdaw, peewit, and water-hen—all common, yet all belonging to different natural groups—would possess a solid body of information, and have in hand a real educational key that would go far to unlock and interpret the life activities of any other species subsequently met. Meanwhile, his mind is unconsciously at work comparing and contrasting; and, when sufficient progress has been made, he will begin to draw conclusions and to frame incipient theories of his own. It is at this time that he will most need intelligent guidance.

Problems and their Solution. It is only possible to suggest briefly some of the problems to be met with and the lines along which attention should be directed in solving them. For instance, in studying feeding habits, useful information may be gained as to the species that are useful or harmful to the gardener and the farmer; while the same question can deal with the specialization of different birds in the method of securing their food, and the adaptation between the food and the way of taking it. The thrush, swift, woodpecker, owl, kestrel, and kingfisher are excellent examples. Again, many interesting studies of family relationships may be made with regard to food and plumage, as well as to nest-building and general habits. Take the crow

family as an example. While the rook and jackdaw are extremely sociable at all seasons, the magpie and jay only form winter family parties; while the raven and carrion crow prefer life in isolated pairs. The rook and carrion crow build large open nests near the tops of high trees—the former in colonies; the latter, singly. The magpie, also nesting in tree tops, builds a roof over its nest; the jay shelters her nest by building later, and frequently hiding it deep in evergreen firs; while the jackdaw completely hides his nest in a hole of a tree or a cliff, in a chimney, or a belfry. Such facts, considered separately, are interesting; but, correlated for a whole family, throw valuable light upon the family traditions and ancestry.

Take the finches again—the chaffinch, greenfinch, goldfinch, bullfinch, linnet, and twite, for example—and then consider how immensely the house sparrow—the Ishmael of his tribe—gains in interest when regarded as a finch and considered side by side with his nearest relations. Compare his habits and make-up with those of the chaffinch or goldfinch: his plumage, song, food and feeding habits, plebeian pugnacity; how he has forsaken almost all his family traditions and become voraciously omnivorous—almost parasitic on man—building the most slovenly nest of the most heterogeneous mixture of materials and placing it high up in holes in the wall, etc. He is the finch of the house and the street; yet, in the practical affairs of life, he is a great success. Indeed, he is an excellent illustration of the two chief factors in the evolution of species: viz., departure from type, and of complete adaptation to an environment entirely foreign to the traditions and instincts of his family.

These two instances of the crows and the finches are given merely as illustrations and because they are known to all. Every natural group can supply instances as cogent as the crows and finches. Indeed, every detail of a bird's life and activity is naturally correlated both with its ancestry and its present environment. In securing specimens for the school museum, the aim should be to obtain representatives of all the natural groups; and a few mounted skeletons of widely different groups would provide untold opportunities for correlating structure and habit, and for demonstrating the essential differences between birds and other vertebrates and their place in the general scheme of living organisms.

W. BICKERTON.

BIRKBECK COLLEGE.—In a history of educational institutions, Birkbeck College would hold a unique position as the pioneer of evening adult education. It was founded, in 1823, by Dr. George Birkbeck "for the purpose," in his own words, "of giving instruction to Students in the principles of the arts they practise, and in the various branches of Science and useful knowledge."

The College is situated in Bream's Buildings, just within the City of London, between Chancery Lane and Fetter Lane, and is adjacent to the Roll's Buildings and near the Inns of Court. Through many stages of development, the institution, ever constant to the aim of its founder, has progressed until it has evolved into a college giving advanced education of university rank. It may with some reason be held to present a kind of epitome of the growth of education in the last century. Its origin marked the rise of a wave of interest in the education of the people, and its life and history correspond with the progress of education from a time

when its provision was poor and inadequate to a period rich in opportunities for those who seek them.

From its origin, the College has been a democratic institution in the best and truest sense. With no political character or aim at any stage of its existence, it has simply sought to offer to men and women of limited means and leisure the chance of obtaining knowledge at little cost; and it has succeeded by constantly adapting its services to the needs and demands of the time, as standards of education have advanced. Its present rank and character are evidenced by the fact that, in a typical session, forty-seven of its students graduated at the University of London, seventeen with Honours; and out of a total of 920 students, 415 were matriculated students of the University, working for degrees in faculties of Arts, Science, Law, or Economics.

Origin and Development. The founder of this beneficent institution was a medical man, who was moved to offer lectures on Natural Philosophy to mechanics by finding out their complete ignorance of scientific principles when required to make apparatus for him. Dr. Birkbeck was an eloquent and stimulating teacher; his lectures became very popular and attracted public attention. From this simple beginning sprang the Mechanics' Institution movement, which spread rapidly over Great Britain, and in a few years invaded the Colonies and the United States.

The remarkable popularity of Dr. Birkbeck's lectures gained the support of several liberal-minded men, who shared his views that the education of the people was the basis of national progress. To give the movement permanence and a home, premises were secured in Southampton Buildings, Chancery Lane; and, by the aid of subscriptions, a convenient theatre was added. On the foundation stone of this lecture hall (which is preserved at Bream's Buildings) are the names of Henry Brougham, George Grote, J. D. Gilchrist, Francis Place, William Ellis, and others.

The Institution proved very successful; the generous spirit of the founder spread enthusiasm among his supporters and listeners, and enlisted other helpers. By degrees, courses of lectures on various subjects—languages, literature, commerce, law, and philosophy—were added. Women were admitted by resolution in 1830, apparently the first opportunity given to women to obtain such instruction on equal terms with men. The enlarged curriculum attracted students from various classes, and extended the field of mental culture: the institution thus became a centre of educational activity.

Meanwhile, the public interest in higher education was growing in the Metropolis, and its advocacy led to important developments. University College was founded in 1827, and there, in recognition of Dr. Birkbeck's public service, a scientific laboratory was named after him. King's College was established only a few years later. In the City a "New Institution for Commercial Education" was opened in 1848 (now known as the City of London College). The Working Men's College and other institutions combining instruction and social aims, date from the same period. The inspiration and example of Dr. Birkbeck were undoubtedly factors in the intellectual awakening of the time. The country was also gradually becoming alive to the importance of national elementary education and the proper provision of day-schools. It is interesting to note that

it was from the platform of the Birkbeck Theatre that William C. Forster, in 1870, made known his proposals for the National Education Bill.

With some fluctuations, the institution continued to grow in numbers and in importance until increased accommodation became urgent and imperative. In 1881, Lord Northbrook, who had become President of the institution, initiated a movement for extension, which, after some years of strenuous effort, resulted in the erection of the present buildings. The cost was £23,000, and this sum was raised entirely by voluntary subscription. The new premises were opened, in 1885, by the late King Edward VII (then Prince of Wales). The College was now enabled to enlarge its scope and thus to widen its sphere of usefulness. Its character and efficiency steadily advanced with the increased opportunities offered by greatly improved conditions.

Connection with the University of London. In the year 1858 the University of London had decided to throw open its examinations for degrees to all comers. This action gave a great stimulus to the private student, and many then engaged in day work eagerly sought aid in evening classes to qualify themselves for these degrees. The College responded to this demand, and organized classes on the University syllabus so as to provide systematic instruction for the Degree subjects. The institution interpreted its function broadly, and aimed at satisfying new intellectual demands on the part of evening students as they arose. It had also become a centre for University Extension work, and the lectures on Economics and Literature attracted large audiences.

The Science Department continued to draw large classes for the Science and Art Department Courses, and the Art School conducted successful classes in drawing and painting, designing and modelling. On one evening a week, a popular lecture was given in the theatre by some distinguished public man, varied by an elocutionary entertainment or a concert.

During this period of intense activity, when the College had few competitors, every effort was made to increase its services and extend its educational influences. More than 3,000 students filled the classrooms, and the institution was the chief centre for evening education in the Metropolis. In course of years, with the cultivation of public opinion, the desire for knowledge increased, and especially for instruction in commercial and technical subjects. Then came the establishment of well-equipped polytechnics and County Council institutes and classes. These evening institutions provided both adequate and efficient instruction for industrial and commercial training at low fees, and also developed advanced classes in Science. This increased supply gave a great impetus to evening education, and naturally tended to specialization of work. Birkbeck College was not equipped for technical work and, having already developed on academic lines, was constrained to concentrate more exclusively on the degree subjects, the demand for which was also stimulated by the general advance in education. Thus within the last decade Birkbeck has become virtually a college for university work only.

Finance. For nearly eighty years this parent of evening education received no public grant or aid, unless the grants earned by the Science and Art examinations of its students be so regarded. It was maintained by purely voluntary effort; its early lecturers gave their services, and for many years much of the teaching was voluntary or received a

merely nominal remuneration. When it became admitted that national education was a public duty and institutions multiplied, the voluntary system was extinguished. In 1901 the College received financial aid from the Technical Education Board of the County Council and also an endowment from the City Parochial Foundation Funds, and after a time regular grants were made by the London County Council for both maintenance and equipment. This liberal aid conduced greatly to efficiency and higher developments.

As a voluntary institution, Birkbeck College had fostered the taste for knowledge, and had helped several generations of young citizens to positions of greater usefulness and work long before universal education came to be regarded as a national investment and a public duty. The economic value of a liberal education is now perhaps one of the few subjects on which there is general agreement.

Modern Courses, Activities, and Successes. Birkbeck College remains mainly an evening institution, a college for breadwinners, though it has also a comparatively new Day Department. Its function is now to supply University education at moderate cost to those whose circumstances render expensive a matter of importance, and thus it is doing very effectively. The College staff consists of graduates of high distinction (of both sexes), all of whom are specialists in their own field: they are recognized teachers of, and also examiners in, the University. Members of the staff, too, have been selected for important professorships at other universities and colleges.

The educational standing of the College and its academic character have been frequently admitted by public authorities. In the Report of the Royal University Commission of 1892, reference was made to its work, and several members of the staff were recommended as recognized teachers of the university. A Treasury Committee on University Colleges reported (1910): "Birkbeck College is doing work which is of considerable importance in providing education of a University standard, especially for evening students who are preparing for examination." In the Final Report of the Royal Commission on University Education in London (1913), the Commissioners write: "We think that the original purpose of the Founder of Birkbeck College, and the excellent work that Institution has done for the education of evening students who desire a University training, mark it out as a natural seat of the Constituent College in the Faculties of Arts and Science for evening and other part-time students." Birkbeck College, as the oldest evening college in Great Britain, is appropriately situated at the very centre of the Metropolis. Its position renders it easily accessible from all parts. Students come from not merely all districts of London and the suburbs, but from places distant many miles beyond its area.

The students, about one-third of whom are women, include—among others—teachers, civil servants, municipal officers, clerks, bankers, business men, lawyers, and skilled artisans. Proximity to the Inns of Court gave the College a legal connection in its early days; many law clerks and students for law degrees have attended its classes. One member of the legal staff has been Dean of the Faculty of Laws, and another is a member of the Senate of the university.

The College has well-appointed lecture rooms, and good laboratories for Physics, Chemistry,

Botany, Zoology, and Geology, admirably equipped with apparatus, for which it is indebted to County Council grants. There is a good reference library, staff and students' common rooms, and a large and commodious theatre which will seat 1,000 persons. There are also scientific and literary societies and clubs, and a students' union; and, in all these, college life is vigorous. The students also produce a College magazine. During the war, the College formed a very efficient Officers' Training Corps of about fifty members, most of whom obtained commissions. During 1915 the College staff combined to give a course of lectures on military subjects.

The great and pressing need of the College is for larger premises and increased accommodation. It has required much skill and ingenious organization to enable the College to carry out so efficiently the amount and variety of work that it performs in the space at its command.

At the Annual Meeting on Founder's Day, 1913, the Minister of Education (Mr. Pease) forecast a great future for the College in the projected reorganization of the University, and intimated the possibility of public aid for that purpose. The war for the time, unfortunately, deferred these expectations of enlargement. But if the College is to fulfil its destiny and perform its full part in the future of the University, its resources and accommodation must be materially augmented. Thus may the dream of its founder in 1824 be realized, when, on laying the foundation stone of the theatre in its first permanent abode, he said: "My friends, we are about to erect a temple to the increase of knowledge, to the diffusion of the riches of the mind, to the amelioration of the human intellect; we are proceeding to found an institution for the improvement of the noblest faculties of man, to which the invitation shall be as universal as the dominion of knowledge, to the highest and humblest, alike and equal."

Like other colleges, Birkbeck suffered very severely from the war. Both staff and students responded nobly to the call of duty. It is impossible to obtain complete statistics of past students who gave service; but from recent available statistics, 607 members of the staff and students joined the Army or Navy. Of these, ninety gave their lives in the service of their country and fifty-four were mentioned for Honours and Distinctions. G. A. S

BIRKBECK COLLEGE.—(See POLYTECHNICS, THE LONDON.)

BIRKBECK, GEORGE (1776–1841).—Was a native of Settle, in Yorkshire. After studies at Leeds, Edinburgh, and London, he became Professor of Natural Philosophy in the Andersonian University of Glasgow when only 23. For the construction of his instruments he had to employ unskilled mechanics, and this ultimately led him to commence science lectures to teach such men the principles underlying their everyday work. He continued these lectures for some years, but left Glasgow, in 1804, to become a physician in London. In 1823 he lent his support to the foundation of a Mechanics' Institution in London, and when it was opened in 1824 he was elected president, an office he maintained until his death. (See also BIRKBECK COLLEGE.)

BIRMINGHAM DAY TRAINING COLLEGE.—Was founded in 1890, and was one of the first

institutions of its kind recognized by the Board of Education. Previously the institution had been carried on by a local committee for giving teachers some opportunity of obtaining experience through the assistance of the Mason University College. Women only were admitted until 1894, when the Mason College took over the management and undertook the training of teachers as part of its work. Students usually read for a degree. There is accommodation for 85 men and 59 women.

BIRMINGHAM, KING EDWARD THE SIXTH'S SCHOOLS.—On the foundation of King Edward the Sixth in Birmingham, which dates from 1552, there are now nine schools: a High School for boys, a High School for girls, three Grammar Schools for boys (Aston Camp Hill, Five Ways), and four Grammar Schools for girls (Aston, Bath Row, Camp Hill, Summer Hill). The total number of pupils in the schools is about three thousand, one-third of them being foundation scholars entitled to gratuitous instruction. The leaving age at the High Schools is 19; at the Grammar Schools, 16. The education supplied is of the highest quality.

BIRMINGHAM NATIONAL EDUCATION LEAGUE, THE.—Was founded in 1869 under the chairmanship of George Dixon, with Joseph Chamberlain as vice-chairman and Jesse Collings as secretary. A Provisional Committee of about thirty members, all associated with Birmingham, was formed to draw up a scheme for the furtherance of a system of education which should reach all those children who were growing up in ignorance. It was felt that, where a sufficient school accommodation did not exist, the deficiency could be speedily and adequately supplied only by the combined action of the central and local authorities, but that the new machinery provided by them need not injuriously affect such existing schools as were satisfactorily educating the people. But the committee considered it all-important that education should be brought within the reach of the poorest children, and that the poverty of parents should not be allowed to stand in the way of the education of their children.

Objects and Methods. The object of the League was stated to be the establishment of a system which should secure the education of every child in England and Wales, and the means as follows: (i) Local authorities shall be compelled by law to see that sufficient school accommodation is provided for every child in their district; (ii) the cost of founding and maintaining such schools as may be required shall be provided out of local rates, supplemented by Government grants; (iii) all schools aided by local rates shall be under the management of local authorities, and subject to Government inspection; (iv) all schools aided by local rates shall be unsectarian; (v) to all schools aided by local rates, admission shall be free; (vi) State accommodation being provided, the State or the local authorities shall have power to compel the attendance of children of suitable age not otherwise receiving education.

At the first general meeting of the League in October, 1869, it was resolved to introduce into Parliament a Bill embodying the principles of the League. Letters of sympathy and approval were read from the Marquis of Lorne, Charles Kingsley, Professor Huxley, Blanchard Jerrold, Professors Roscoe and Jevons, and many others interested in

education. The League was well supported by donations, and proceeded to disseminate its views by means of meetings, publications, lectures, and discussions. A large number of Members of Parliament joined the League, as did many ladies and gentlemen in all parts of the country.

When Mr. W. E. Forster (*q.v.*), brought his Education Bill before Parliament in 1870 its general principles received strong support from the Birmingham League, though objection was taken to Mr. Forster's declaration that the newly-designed schools were intended to supplement and not to supplant the existing schools. The League would have preferred that there should be no schools under voluntary managers, and would have placed the whole State-help to education in popular hands. The League has always been guided by the principle that all education supported by the State should be secular, compulsory, and free.

BIRMINGHAM, THE UNIVERSITY OF.—In 1898 a public meeting was held at Birmingham to consider the desirability of founding a local university which should play a part in the social, intellectual, and industrial life of the Midlands similar to that performed in Lancashire and Yorkshire by the new universities of Manchester and Liverpool. It was resolved that, if a sum of £250,000 could be raised, steps should be taken to petition the Privy Council for a charter of incorporation. Mr. Andrew Carnegie subscribed £50,000, and an anonymous donor duplicated this gift; by the following year £325,000 had been secured, and the charter was granted in 1900.

The new university was unlike any of its predecessors in one important particular: great stress was laid on the equipment of the commercial and industrial sides of the curriculum, and applied science and essentially modern subjects were the main pre-occupation of the promoters. Not that any of the faculties of a university were neglected, but these were regarded as a mere background to the more practical work. A note of utilitarianism was struck, signaling the simultaneous birth of a new type of *studium generale* and the advent of a new century.

There was already a college of university rank in the city, characterized to a considerable extent by the same singularity. Mason College, founded by Sir Josiah Mason (1795-1881), a great pen-manufacturer and electro-plater, who had risen from street-trading in Kidderminster to a position of affluence and honour in Birmingham, where he had as partner Mr. Elkington, was opened on 1st October, 1880, with the avowed aim of promoting "thorough systematic education and instruction specially adapted to the practical, mechanical, and artistic requirements of the manufactures and industrial pursuits of the Midland district, and particularly the boroughs of Birmingham and Kidderminster, to the exclusion of mere literary education and instruction, and of all teaching of theology." Notwithstanding these limitations, Greek and Latin were soon added to the scheme, and a deed of 1881 provided that any other subjects judged necessary might be introduced; indeed it was decided that a revision of the scheme should take place every fifteen years. In 1897 the trustees obtained a new Act of Parliament whereby the theological prohibition was removed.

Earlier still, in 1828, Queen's College had been founded as a school of medicine, other subjects

being afterwards added. But in 1882, the bulk of the scientific teaching done at Queen's College was transferred to Mason College, and ten years later the medical department was removed there also by order of the Court of Chancery, a change that improved the Birmingham School of Medicine very greatly. Queen's College is now devoted to Anglican theology and numbers but few students.

The new university absorbed Mason College. A site of upwards of twenty-five acres at Edgbaston was presented by Lord Calthorpe for the buildings, which were erected at great cost. Mr. Joseph Chamberlain was the first chancellor.

The university keeps in close touch with the secondary schools of the district, and facilitates the entrance of the scholars by accepting certain school leaving certificates in lieu of the matriculation examination; by a system of inspection of schools which supply undergraduates; and by encouraging the offer of scholarships by local education authorities. There are four faculties: Science (B.Sc., M.Sc., D.Sc.); Commerce (B.Com., M.Com.); Medicine (M.B., M.D., Ch.M., B.D.S.); and Arts (B.A., M.A., D.Litt., D.Phil., B.Mus., M.Mus.). The length of the course of study is usually three years, and class-exercises and lecture-notebooks are considered as well as examination papers in awarding classes and passes. Graduates in honours proceed to the master's degree without further examination; and the doctorates are conferred only on the presentation of theses embodying the results of valuable research. The medical course extends over five years.

Besides the scholarships and free places provided by the local education authorities, there are about twenty scholarships awarded by the university, chiefly on the results of the matriculation and intermediate examinations, and there are ten scholarships tenable only by graduates engaged in research work. There is a hall of residence for women at Edgbaston, but most students live at home or in lodgings. The Guild of Undergraduates controls the social life of the students, and there is a University Club open to all past and present members of the university.

BISHOP OTTER MEMORIAL COLLEGE (Chichester).—This College was founded as a memorial to Bishop Otter, who presided over the See of Chichester from 1838 to 1843. Until 1873 it was used for training schoolmasters, but subsequently as a college for training daughters of the clergy, professional men and others as elementary teachers. Until 1897 it accommodated about forty students; subsequent enlargements have increased this number to 100. The College possesses a number of fine lecture rooms, science rooms, a conservatory, and a large library. Professional training is provided in the schools of Chichester, Portsmouth, and Southsea.

BISHOPS' SCHOOLS.—From the early days of the spreading of Christianity through Southern and Western Europe, the bishops of the Church were the chief organizers and controllers of education among its members. Schools established by bishops existed in Italy and Gaul as early as the fifth and sixth centuries, and the subjects of instruction were chiefly grammar and rhetoric. As the Christian Church was extended further into heathen countries, Latin was taught in order that the monks and other churchmen might be able to understand the

sacred books used in the church and the monasteries. The missionary Augustine set up a school at Canterbury; and, at York, Paulinus established a school, at which the Archbishop Albert (or Ethelbert) was famous for his teaching in the eighth century. Alcuin, who succeeded Albert, has recorded the names of subjects taught in the school of York, including grammar, rhetoric, astronomy, geometry, and arithmetic, as well as music, for originally the school was probably a school for singing. The bishops ceased to teach soon after the Norman Conquest, though many schools remained under their control; and in the sixteenth century they held the sole power to grant licences to teachers. Their jurisdiction over schools was greatly curtailed by the Endowed Schools Act, 1869, and practically ceased on the passing of the Act of 1902.

BISHOP'S STORTFORD TRAINING COLLEGE FOR SCHOOLMISTRESSES.—This College was founded, in 1852, by the Rochester Diocesan Board of Education, and remained in that diocese until St. Albans was formed. It is situated on a slight eminence near Hockerill Church, is of red brick built in a quadrangular form, and surrounded by extensive grounds. The chapel was built in 1879, and has been furnished and decorated by gifts from successive bodies of students. A new wing was added in 1890, in memory of Dr. Cloughton, Bishop of St. Albans, including a gymnasium and a recreation room. Further enlargements in 1905, 1906, and 1912 provided new dormitories, a new kitchen, a library, and a chemical laboratory. The original accommodation for sixty has been raised to 123 residential students, of whom about thirty lodge at the annexe in Hockerill Street. The first Principal was the Rev. John Menet, M.A., whose pamphlets on school work and methods were widely circulated among teachers. The present Principal (the Rev. A. E. M. Aynsley, M.A., of Sidney Sussex College, Cambridge) was appointed in 1898. The staff includes a member of residential university graduates of high school and training college experience, besides several visiting mistresses. The College course is directed chiefly to the Board of Education requirements for teachers' certificates. In recent years a number of students have spent a third year of training in France, and have passed their final examinations as third-year students. The recreative side of student life is well provided for in the extensive grounds of the College, and gardening is practised by the students. Candidates from Essex and Hertfordshire are admitted at reduced fees.

BLACK AND WHITE WORK.—A section of instruction in drawing and design, in which the materials used are pencils, charcoal, crayons, pen and ink, and oil colours in black and white.

BLACKBOARDS.—Probably the modern representative of the writing tablets of the ancient races. They have long been used for class demonstration and for exercises by pupils. For many years, the common type has been made of wood painted or stained black, the best surfaces having the least glaze. For use with white chalk, a black surface, under proper conditions of light and distance, imposes little strain on the eyes of the pupils; whereas a white surface, with black chalk, would be better for easy vision, but would impose greater eye strain. Slate surfaces are better than those of wood, as they can be washed without injury and

they do not produce so much white dust. But only green or black slate should be used; greys and browns are less suitable. Slate is expensive and, where expense is a consideration, a board can be made of sheets of compressed paper, but such a board is not durable, is liable to warp, and absorbs moisture easily. A good board can be made of glass, ground on one side for writing and darkened on the other.

BLACKBOARDS.—(See EQUIPMENT, SCHOOL.)

BLACKFRIARS THEATRE AND THE BOY ACTORS IN ENGLISH DRAMATIC DEVELOPMENTS.—Up to the reign of Queen Elizabeth, there was no permanent theatre, aside from the Royal Hall, where plays might be performed. Within the first twenty years of Elizabeth's reign, all forces combined to develop the permanent theatre along two lines: one in a straight course through the Court to the "private theatre" of the Children of the Chapel; the other through the companies inspired by the Court and swinging off among the common people to the "public theatre" of the men companies.

In April, 1576, James Burbage, at the head of Lord Leicester's players, and his brother-in-law, John Brayne, began the first "public theatre" of London in Shoreditch, modelled on the plan of the roofless, balconied coach-court of the public inn, then used for acting. Six months later, for better rehearsing the Children of Windsor and the Children of the Chapel at a profit, Richard Farrant leased the old Revels Office building in the Blackfriars cloister, and proceeded to convert it into the first "private theatre" of London, on the model of the Royal Hall.

For four years, until his death in 1580, Farrant conducted his little theatre in the Blackfriars with the Children of Windsor, under his mastership, and the Children of the Chapel Royal, under the mastership of Hunnis. The Children of Windsor began their acting career under Farrant in 1564, and appeared at Court practically every Christmas thereafter until his death in 1580, forming an important factor in the development of the drama. From that day to this they have not again acted at Court. A master as dramatic poet was a first requisite to the acting of these and all other children companies, whether at Court or in school, prior to the private commercialization of their successes during the last years of Elizabeth.

The First Blackfriars Theatre. In 1580, William Hunnis and John Newman took the little Blackfriars theatre over from Farrant's widow, and continued to conduct it on the same lines of Court-developed drama with the Children of the Chapel alone.

On account of legal difficulties with the owner of the Blackfriars property, Hunnis and Newman posted their lease over to Henry Evans, a Welsh scrivener, later attorney at the Common Law. About the same time, in 1582, died Sebastian Westcott, who for over a quarter of a century had entertained Elizabeth as Princess or Queen at nearly every Christmas with plays acted by the boys of St. Paul's choir under his mastership. His successor, Thomas Gyles, did not, until three years later, use the boys in acting. In the meantime, they were united with the Children of the Chapel at Blackfriars under Evans's management. Trouble continuing, the lease was transferred to the Earl

of Oxford in 1583, who, in admiration for his *protégé*, John Lyly, made a present of the Blackfriars theatre to Lyly. The opportunity made an embryo dramatist of Lyly. The united companies of the Children of the Chapel and Paul's boys at Blackfriars were then called "The Earl of Oxford's Boys." To Lyly, the Earl also joined George Peele, both wild young university poets and wits like himself. All were deeply adulatory of the Queen, with whom the young Earl was especially friendly.

With this combination of boys of the Court as actors, young university wits as poets, a Court favourite as Maecenas, and Blackfriars as the semi-official centre of Court traditions, the drama attained the next stage of development, dramatic form, namely, in Lyly's "Campaspe" and "Sapho and Phao," acted respectively at Court on 1st Jan. and 3rd March, 1584; and in Peele's pastoral, "The Arraignment of Paris," also acted at Court between those dates. Though they seem tinselly in comparison with later achievements, these plays by Lyly and Peele for the boy actors at Blackfriars and the Court mark a new era in the form of the English drama. They are the next natural step in the evolution of the native English drama through the boy actors and their masters at Court, the first modern five-act plays ever known to have been performed before a public audience in an English theatre.

We must differentiate sharply here. They are not modelled on the classics in any sense. They are based in no way upon the Latin plays of schools and universities, but are independent of them at every point. They show no iota of influence from such English classic hybrids as "Ralph Roister Doister," "Gammer Gurton's Needle," "Gorboduc," and the rest. They cut loose absolutely from the old moralities. They have no ancestral or acquired relation to the old-time Church drama. They are simply the natural development of the native genius of drama under cultivation of the Court from the days of Cornish into artistic five-act form. The next natural step in dramatic evolution had been taken, never to be retraced. Court, theatre, and university had met at the Blackfriars in Lyly and Peele, and the boy actors of the Court, and the five-act drama had come to stay. The importance of this achievement, and of the part played by the children actors of the Court in the long evolution, cannot be overestimated. It marks the beginning of the modern English drama as we know it best in Shakespeare.

The End of the Child Actors. Simultaneous with the achievement of dramatic form came the termination of the first Blackfriars theatre, through lawsuits, in 1584. At the break-up, the united company of boy actors, consisting of the Children of the Chapel and the choir boys of St. Paul's, went to St. Paul's singing school as their theatre, under Thomas Gyles, master of the Paul's boys. Peele went to the public theatres, and Lyly continued with the boy actors at St. Paul's, both writing along the lines developed at Blackfriars. Their mode attracted others—as Greene, Lodge, Nash, Kyd, and Marlowe, all young university men just out of college—and became universal, spreading its dominion over the whole realm of drama, vanquishing the Latin and shaping the vernacular.

Little by little, as the Court influence spread to outside companies, the original Court centres ceased activity. The gentlemen of the Chapel acted no more after Queen Mary. The Children of

Windsor, beginning in 1564, ceased in 1580. The Children of the Chapel Royal, acting annually since the days of Cornish, and forming the core of dramatic evolution, practically ceased with the closing of the first Blackfriars in 1584, until the opening of the second Blackfriars about 1597. The choir boys of St. Paul's ended an unbroken Court career of over thirty years with the Christmas season of 1589–1590. The boys of the grammar schools of Eton, Westminster, and Merchant Taylors', never companies of actors in the proper sense, were invited to act at Court only occasionally from 1572 to 1583 and never afterwards, merely in emulation of the native English drama of the Children of the Chapel at Court.

After the closing of the first Blackfriars in 1584, for about fifteen years the men companies had it all their own way at Court as well as before the public, except in the single instance of St. Paul's to 1589. The way the men's companies took up the new drama, evolved through the children actors at Court in the course of three quarters of a century, and carried it on—first side by side with them and then beyond them—is one of the remarkable features of dramatic history. The influence of the Court drama of the boys lived dominant even in the public theatres of the men that supplied the places of the boy actors. Even masque and song—Court features first introduced by Cornish and the boys of the Chapel under him, and more organically incorporated into the plays at Blackfriars by Lyly and Peele—still lived on in Jonson, Chapman, Middleton, Marston, Shakespeare, Beaumont, and Fletcher.

The descent of the modern five-act drama from the native English instinct, through the Court and the Blackfriars, by way of the Children of the Court as actors, and their poets (Cornish, Heywood, Edwards, Farrant, Hunnis, Peele, and Lyly to Shakespeare and his fellow-dramatists at the public theatres), is as straight and direct as any pedigree ever registered at the College of Heralds.

Not until 1597 or 1598 did the Children of the Chapel again begin acting regularly. Again they were organized into a private company for profit, at the new Blackfriars, which was completed by the Burbages in 1597—later celebrated as Shakespeare's Blackfriars—and again they were under the directorship of Henry Evans, by special arrangement with Nathaniel Gyles, their new master, who succeeded Hunnis in 1597, Evans agreeing to pay Gyles fourteen shillings a week for the use of them.

Similarly, the boys of St. Paul's were farmed out by their new master, Edward Pierse, to Thomas Woodford, and renewed acting at their singing-school as a theatre about 1599–1600. Here they acted many of the best plays of some of the most famous writers of the age—Lyly, Chapman, Middleton, Marston, Dekker, Webster, and Fletcher—until 1608, when Shakespeare and his company, for the sum of £20 a year, bought off their master, Edward Pierse, to close them up. Paul's boys ceased to play, and have never acted since. One of their plays by George Chapman, "The Old Joiner of Algate," hitherto unknown, illustrates the ultra-modern trend of their activities. It staged a real romance of London life. A barber's daughter, heiress of her wealthy aunt, Margaret Shales, the first eminent donor to Christ Church, Newgate Street, was contracted by her father to several money-loving suitors, one after the other, for large considerations to him. The romance involved many

prominent people of London, some from the Court; and the play, acted in January–February, 1603, was the sensation of old London town. Materials relating to it, enough for a volume, with plot and characters, were discovered in 1907 by the present writer.

The Children of the Chapel at Blackfriars, however, were far more important than Paul's boys. As the direct descendants of a century of dramatic evolution around the Chapel Royal to which they belonged, and acting under the Queen's favour in sharp rivalry with Shakespeare's own powerful company, they were by far the most important of all boy companies that have ever acted. The Duke of Stettin, who saw a play by them in 1602, reported that the Queen provided the boys with apparel and other necessities, and required them to be taught music, singing, and dancing for Courtly purposes, and to act one play a week. In fact, they acted almost daily. Theirs became the fashionable theatre of London, patronized by Queen, Court, nobility, and the London *élite*. Their poets were Jonson, Day, Chapman, Marston, Beaumont, and Fletcher—all the greatest dramatists of the age except Shakespeare. They constituted the famous "aerie of children, little eyases that cry out on the top of question and are most tyrannically clapped for," against whom Shakespeare inveighed in that famous passage in "Hamlet." Royal patronage and their great galaxy of poets gained them such popularity and following that the public theatres suffered. Not even the superior genius of Shakespeare, called to its supreme exertions in the contest, was able to stem the tide for a time; nor did it quite succeed in doing so until after the death of Elizabeth, when the intervention of King James against the further use of the Chapel boys as actors under Royal support, and in behalf of the men actors, particularly of Shakespeare's company whom he made the King's Players, came to the support of that genius with Royal favour and following, and doomed further successes of children companies from that day to this.

The New Blackfriars. In 1604, King James, having prohibited further use of the Chapel boys as actors, allowed the Blackfriars theatre to be conducted with the older boys (now growing toward young manhood), as actors on the level of the men companies, under title of Children of the Queen's Revels, but always under disfavour and suspicion. In 1608, on account of Chapman's tragedy of "Biron" attacking the French king, he suppressed them utterly.

Thereupon Shakespeare and his associates, in August, 1608, took over the lease of the Blackfriars and some of the boys with it, and made it yet more famous with his plays on its stage, such as "The Tempest," especially adapted to the new theatre and the boy actors. At the same time, they bought off St. Paul's, and closed it up, as above related.

This was practically the end of boy companies of actors, though some of them struggled on for a few years at the Whitefriars, and echoes of them lived for yet half a century.

Their influence, however, lived on. The Blackfriars became the model for all later theatrical structures, and is thus historically of first importance. The boys themselves, grown men, did, as Shakespeare foresaw in his animadversions upon them, become "common players," and, more important yet, grew to be leading actors in every

company but one, some of them—as William Ostler, Nathaniel Field, John Underwood, William Ecclestone, Joseph Taylor, Robert Benfield, and Richard Robinson—ultimately replacing such famous men as Richard Burbage, Henry Condell, and John Heminges in the acting and management of Shakespeare's own former company; and, even as early as 1623, standing recorded in the First Folio edition of Shakespeare among "the Principall Actors in all these Playes," and finally, as the principal men in the King's company, at the Globe and Blackfriars, dominating the whole theatrical policy and shaping the character of the English drama to their ideals and needs, up to the final fall of its fading florescence when the Civil Wars began and the theatres closed, in 1642.

Their chief influence, however, lies in the drama that reached its climax of achievement in the decade that coincides with the activity of the Blackfriars boys preceding their suppression in 1608, drawing out to the full the powers of Shakespeare in supreme achievement, to meet the competition of their poets, Jonson, Chapman, Day, Marston, Beaumont, and Fletcher. It strikes us as astounding that, during this period, approximately one-half of all the plays were by the boys of Blackfriars and St. Paul's; and that every great dramatist of the period, except Shakespeare, wrote for these children companies, and did their best work in that service. Music, singing, and dancing—the original entertainment functions of the Chapel boys, developed by Cornish, Heywood, Edwards, Lyly, and their later poets into the integrated mask—were perforce introduced into the plays of the men companies also, necessitating apprentice boys to help them in such parts. So also our musical prelude and interspersions of songs and music descends from them. Their developed five-act form, already observed, became the great dramatic vehicle for every story of human interest, whether ancient tale or legend, or history, or modern London life.

The native English drama, originating in the iconoclastic spirit of "the joy of life" in the Court of Henry VIII, in revolt against the life-censuring didactic drama of Church origin, and in disregard of the classic and neo-classic Latin drama of school and university, developing around the Chapel boys as a centre, and evolving finally out of the Court into the wider domains of the theatre and the people, thus grew within a century to the most powerful literary expression of all time.

A knowledge of the proper place and relation of these children companies in the development of both theatre and drama, gives just recognition to the value of every slightest detail of their history. Unfortunately nothing very definite has been known about them, their history, their influences, and particularly their place in the evolution of the modern English drama, prior to the present writer's researches, so that a useful bibliography of reliable information is necessarily limited. Many of the materials are yet to be published, and are in hand to that end.

C. W. W.

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BLACKSTONE, SIR WILLIAM (1723–1780).—William Blackstone, Oxford professor, judge and jurist, was of West of England stock and was the third son of John Blackstone, a London apothecary. He was the nephew of Dr. Bigg, the warden of Winchester School. He was born in Cheapside on 10th July, 1723. His brothers Charles and Henry were educated at Winchester School, and both became fellows of New College, Oxford, where a relative, Walter Bigg, was warden. William was educated at Charterhouse School and Pembroke College, Oxford, and shone both in classics and mathematics. He was admitted to the Middle Temple on 20th November, 1741 and at once took up the study of English law, which he pursued at Oxford after becoming a fellow of All Souls' College in November, 1744. He worked at full pressure in London and Oxford and slowly built up a practice at the Bar, while at All Souls as Bursar he reorganized the College accounts and muniments and delivered the famous lectures on the laws of England (which were attended by Jeremy Bentham, *q.v.*), these lectures forming the basis of his famous *Commentaries, an Analysis of the Laws of England*, issued in four volumes between 1765 and 1769. In 1753 he became a delegate of the Clarendon Press, entirely reorganized that famous institution, and with this end in view made himself a master of the art of printing. He raised the press to a technical height of which one famous monument is his own edition of the Great Charter, published in November, 1759. In 1757 he had become a fellow on the new Michel foundation of Queen's College, where his genius as an architect is still recorded in stone, and in October, 1758, he was elected the first Vinerian professor and delivered the famous lecture which now forms the introduction to the *Commentaries*. For a time he had ceased to practice in London, but Court work was resumed in 1759, and in 1761 he entered the House of Commons, took silk, and also married, thus vacating his All Souls fellowship. He was, however, at once elected principal of New Inn Hall, as his services were needed at Oxford, as one of the heads of congregation. In 1763 he became a bencher of the Middle Temple and Solicitor-General to the Queen. The pressure of work was enormous, and in 1766 he was compelled to sever his connection with Oxford, but he was still lecturing as late as 1764, when Bentham attended his course. In 1770 he was offered, and declined, the Solicitor-Generalship, but accepted a judgeship and succeeded Mr. Justice Clive as a Justice of the Common Pleas. Blackstone sat on the Bench for ten years, many of his judgments being on record. He died on 14th February, 1780, and was buried in the parish Church of Wallingford. Seven of his nine children survived him. It would be difficult to exaggerate the value of Blackstone's work as a jurist, an educationist, and an educational administrator. His influence at Oxford was of a unique character, and the Oxford Renaissance may be said to have begun with Blackstone, whose endless energy and immense range of knowledge awakened the University in

almost its darkest days. He made English law a classical subject of study and set it forth in so attractive a fashion as to make it part of the regular studies of young Englishmen of rank. It may be said without exaggeration that it was the influence of Blackstone which carried the fame and the practical adaptability of the English Common Law into all parts of the world. He was a famous teacher, a notable administrator, a jurist of the first rank, a master of English prose, and the last of the great fathers of the English common law.
J. E. G. DE M.

BLACKWELL, DR. ELIZABETH.—(See WOMEN IN ENGLAND, HISTORY OF, MEDICAL EDUCATION OF.)

BLIND.—The Act of 1893 defines "blind" as "too blind to be able to read the ordinary school books used by children."

BLIND-ALLEY OCCUPATIONS.—One of the chief objects of the Education Act, 1918, was the abolition of blind-alley occupations for children. The means proposed by the Act for securing this end was the prohibition of all paid labour by children under the age of 12; the abolition of all school exemptions under the age of 14 years plus the period necessary to conclude the school term in which the fourteenth birthday occurs; and the creation of compulsory continuation schools for all young persons (not otherwise receiving continued education) between the ages of 14 and 18, the upper limit of age being, however, 16 for seven years after the passing of the Act. The necessity for some provisions of this type had become plain long before the outbreak of war. It was then estimated there were at least 2,000,000 children between the ages of 12 and 17 who were continuously occupied with labour which involved no physical, mental, or moral training; and in a great percentage of cases resulted in both boys and girls being thrown on the adult labour market on the completion of adolescence with no trained capacity, with injured bodies and dulled minds, and with the certainty of becoming unemployable before the age of 30. Moreover, the Reports of the Poor Law Commission of 1906 showed that the cumulative effect of the child labour was to thrust men off the labour market at the age of 50 and thus to create at both ends of the adult scale acute social evils and incapacity. The Medical School Service, created in 1908, showed that the amount of sickness and disease and physical weakness among children was such that, out of some 6,000,000 children at school, at least a million were unable to take proper advantage of the teaching provided. The evil, however, was not limited to children over the age of 12. It was known that children from the age of 7 or 8 years were employed, often for terribly long hours, in the portion of the day that they were not at school, as well as Saturdays and Sundays. These little children were at work from very early in the morning until school-time, in the interval for dinner, and after the conclusion of the afternoon school session. On the outbreak of war, the rules as to school attendance were relaxed, and myriads of children poured into blind-alley war work of various kinds.

Remedial Measures. The accentuation of the evil made it plain that something had to be done, and the upgrowth of welfare work sprang from the

necessities of the case. In 1915 *The Times Educational Supplement* made a strenuous demand for "a necessary revolution" in English education, and pressed for the reforms eventually included in Mr. Fisher's Education Act (*q.v.*). The classes of blind-alley employment that had to be attacked were fourfold. There were the children in Government or controlled employment: these were dealt with as far as possible apart from educational legislation, and a special committee was appointed to consider the care of these children after the war. There were the children employed under the age of 12 in casual occupations during school-time as well as in the vacations: these were dealt with by the Act, which forbade all employment under the age of 12. There were the children over 12 who fell into two classes: those employed in mills or other great industrial institutions, and those employed in an infinite variety of blind-alley casual employment. These cases were met by the provisions of the Act forbidding for children over 12 and under 14 all employment in mines and quarries, and limiting their employment on school days and on Sundays to two hours, and their employment on Saturdays to six hours. This limitation was as far as Parliament felt that it could go pending the readjustment of social conditions following on the war. For children over 14, the provision of compulsory education, intended to secure both a continued school education and also a definite testing of capacity for this or that walk of life, was considered the best way to abolish blind-alley occupations, and the provision was supplemented by elaborate machinery for securing the physical health of all school children and young persons.

J. E. G. DE M.

BLIND AND DEAF CHILDREN, ELEMENTARY EDUCATION GRANT.—

By the Elementary Education (Blind and Deaf Children) Act, 1893, it became the duty of every school authority to enable blind and deaf children resident in their district to obtain education in a suitable school approved by the Board of Education. This Board gives "aid from the Parliamentary grant to a certified school in respect of education given to blind and deaf children to such amount and on such conditions as may be directed by or in pursuance of the Minutes of the Board of Education in force for the time being."

BLIND CHILDREN, TEACHERS OF.—(See AFFLICTED CHILDREN, TEACHERS OF.)

BLIND, EDUCATION OF THE.—The term "blindness" used to be generally accepted as meaning total lack of the sense of sight; but of late years, owing to the exigencies of the situation created by the passing of the Blind and Deaf Mute Education Act of 1891 (England) and 1893 (Scotland), which made the education of blind and deaf children between the ages of five and sixteen compulsory, it has been found necessary to provide such a definition of blindness as will include those who, whilst not suffering total deprivation, are sufficiently defective in the matter of sight as to come under the provisions of the Act. "Blindness" now means: "So defective in the sense of sight as to be precluded thereby from being educated through the ordinary means in use in schools for the seeing; or from earning their living by following

the ordinary trades and occupations open to the seeing." Whereas in the early days of institutions and schools for the blind, no pupils possessing an appreciable amount of sight were admitted, it is now quite common to find in such establishments a considerable percentage who have sufficient sight to enable them to read good-sized ordinary print and move about with comparative freedom. The number of blind persons in this country now may be estimated as, approximately, one in twelve hundred.

Causes of Blindness. These are too numerous to mention here. One cause, however, is so insidious in its operation, so terrible in its results, and so infinitely more common than any of the others, that we must give prominence to it. In medical terminology it is known as *ophthalmia neonatorum*, or purulent ophthalmia of the newly-born. The disease-carrying germs come into contact with the child's eyes during birth and, if not immediately carefully removed by wiping or washing, find their way under the infant's eyelids, and soon set up inflammation. Directly such redness of the eyelids is observed, skilled treatment should be sought; whereas, if the symptoms be neglected, even for a day or two, partial or total blindness must inevitably follow. *Ophthalmia neonatorum* has now, however, been made a notifiable disease, so that there is reason to hope for a speedy check upon its ravages.

Although history records many isolated instances of blind persons who achieved considerable distinction as poets, philosophers, musicians, engineers, and architects—from Homer onward—there is no authentic record of any attempt at systematic education of the blind until the close of the eighteenth century. Of these isolated cases, we would mention a few—

Blind Harry, a Scottish bard, born blind in 1361, and author of an historical poem upon Wallace.

Francis Salinas, a Spaniard, born about 1513, was practically blind from birth, and applied himself early to the study of music. He learnt Latin in return for music lessons; and afterwards studied Greek philosophy and the arts at Salamanca University.

Handel was blind from cataract in his later years.

Nicholas Saunderson, one of the most remarkable blind men of whom we have any record, was born at Thurlston, Yorkshire, in 1682. Although blind from twelve months old, he rose by genius and force of character to be Professor of Mathematics at Cambridge. He invented the first practical, tangible aid to arithmetic, and constructed a board divided into squares: each square contained nine pin-holes, and the numbers were represented by two pins placed in varying positions relatively to the sides of the square. He died in 1739.

John Metcalf was born in Knaresborough in 1716, and lost his sight from smallpox at six years of age. He fought at Culloden and elsewhere, and drove a stage-coach between York and Knaresborough. Amongst other works, he built Boroughbridge; and made roads through Yorkshire, Lancashire, Derbyshire, and Cheshire.

Of blind poets, John Milton is the one with whom people are most familiar.

Valentin Haüy was born, in 1745, in Picardy, France; he first conceived the idea of teaching the blind to read with their fingers by letters embossed

upon paper. In his essay, *The Education of the Blind*, he says: "We ordered typographical characters to be cast of the form in which their impression strikes the eye, and by applying to these a paper, wet, as the printers do, we produced the first exemplar which had till then appeared of letters whose elevation renders them obvious to

founded in Europe. The type used for his books resembled italics. He founded a blind school in St. Petersburg, and died in Paris in 1822.

Louis Braille. In 1809 there was born at Coupvray, Seine-et-Marne, Louis Braille, destined to be the greatest emancipator of the blind. His

father was a harness-maker, and at five years of age, little Louis was blinded whilst playing with one of his father's awls. He was sent to the Blind Institution at Paris; was a clever student and cleverer teacher, especially of music. In 1829 he invented his alphabet, which, after the test of nearly a century, has not yet been improved upon.

The Braille alphabet is built up of varying combinations of six points, arranged with a base of two and a perpendicular of three, thus: $\begin{smallmatrix} \bullet \\ \bullet - \\ \bullet \bullet \end{smallmatrix}$. These combinations provide, in addition to the alphabet, a number of signs or characters which represent groups of letters, words, punctuation, signs, etc. The dots are numbered from the top downwards: the left-hand column 1, 3, 5, the right 2, 4, 6 on the raised side; and, as they are embossed upon the paper, it follows that as each character is reversed when the paper is turned over, the writing must be done from right to left. Thus, whether writing or reading, the dots numbered 1, 3, 5 are always first encountered by the finger of the pupil. The writing, or embossing, is accomplished by a special frame, consisting of a board, with a clip to hold the paper and a brass guide upon which the embossing is done by a small blunt stylus. Two or three forms of typewriter for embossing Braille have been invented and cost from a few shillings to several pounds each. Larger machines for embossing the Braille characters on folded metal

plates enable embossed printing to be rapidly performed. Braille books of all kinds, magazines, and even weekly newspapers, are produced in ever-increasing quantities. Braille's system lends itself readily to music, and the Braille musical notation is admittedly one of the most perfect and comprehensive ever evolved.

Moon Type. The only other system of embossed

1st LINE	A	B	C	D	E	F	G	H	I	J
	but	can	do	every	from	go	have		just	
2nd LINE	K	L	M	N	O	P	Q	R	S	T
	know- ledge	like	more	not		people	quite	rather	so	that
3rd LINE	U	V	X	Y	Z	and	for	of	the	with
	us	very	it	you	as					
4th LINE	ch	gh	sh	th	wh	ed	er	ou	ow	W
	child		shall	this	which			out		will
5th LINE	ea	be	con	dis	en	to	were	?	in	*
		bb	cc	dd	enough	ff	gg	his		was
										by
6th LINE	Fraction-line Sign	Numeral Sign	Poetry Sign	Apostrophe and Abbreviation Sign	Hyphen	Dash				
	sull	ing	ble	ar	com					
	st									
7th LINE	Accent Sign	Capital or Decimal-point Sign	Letter Sign	Italic Sign						
Used in forming Contractions:										

BRaille ALPHABET, WITH CONTRACTIONS

the touch without intervention of sight. Such was the origin of a library for the use of the Blind."

Haüy began his experiments, in 1784, with a blind youth named La Sueur, whom he took to Paris to exhibit as an example of his methods. In 1785 he founded L'Institution Nationale des jeunes Aveugles, the first school for the blind

print in use in this country is what is known as Moon Type. It is a "line" system (*i.e.*, the characters are made up of curved and straight lines), and many letters of this alphabet resemble in form the ordinary Roman letter. The characters are large and somewhat clumsy, but very suitable for those blind people whose hands are hardened by toil, and for the aged blind. Vast quantities of books are published in Moon Type, and most of the libraries are provided with literature in this as well as in Braille type.

Dr. Moon, the inventor, was born in 1818, and became blind when twenty-one. He lived to see the fruit of his labours, and to adapt his type to over four hundred languages and dialects; he died in 1894.

Earlier Printing. The first attempt in this country to emboss books for the blind was made by Gall, of Edinburgh, in 1831. He used the ordinary Roman capital letter, simply replacing curves by angles. He printed the Gospel of St. John and a few other books. His "invention" was found to be far from practical, and soon fell into disuse.

Early Schools and Institutions in Great Britain.

The first school for the blind in Great Britain was built at Liverpool in 1790, its avowed object being "to render the blind happy in themselves and useful to society." A similar establishment was founded in Edinburgh in 1793 "to teach the blind a trade, so that they may, if possible, maintain themselves." This institution is now one of the finest and most successful in the country. The Asylum or Industrial School for the Blind, Bristol, was founded in the same year "not to employ the blind after being educated, but teach them the means of getting a living by work." Southwark School for the Indigent Blind (now the Royal School for the Blind, Leatherhead) was established in 1799. During the nineteenth century many more blind schools and institutions came into existence, the two largest being the Royal Glasgow Asylum for the Blind, and Henshaw's Blind Asylum, Manchester. (For full list of institutions, schools, and workshops, see *Information with regard to Institutions, etc., for the Blind*, edited by Mr. Hy. J. Wilson, Gardner's Trust Offices.) Dr. Moon (already mentioned) founded several home teaching societies for the purpose of visiting the blind in their own homes, teaching them to read, and otherwise ministering to their comfort. There are now hundreds of such societies in the country, and during the last few years they have been organized into what are known as "Unions." The first such Union to be established was the Northern Union of Agencies, Institutions, and Societies for the Blind, comprising Northumberland, Cumberland, Westmoreland, Durham, Yorkshire, and Lancashire, in the year 1906. Although the education of the young formed an important part of the work of institutions for the blind, and many school boards (London, in particular) provided special classes in day schools for their instruction, such education was not made compulsory till the passing of the above Act (England, 1891; and Scotland, 1893). This Act laid upon school boards the responsibility of providing elementary and manual education for blind children, either in their own schools or in special institutions, and a capitation grant of five guineas per annum was allowed by the Board of Education for blind children who satisfied H.M. Inspector. Since that time, the improvement in the condition of the young blind has been most marked. In 1914 the

capitation grant was increased to £13 per annum for pupils in residential and £7 for day schools and later to £16 10s. and £8 10s. respectively.

The College of Teachers of the Blind. In order to promote and encourage the training of teachers of the blind, and to improve their status, and generally conduce to more efficient instruction and training of the children, the College of Teachers of the Blind was founded in London in 1907. The College is officially recognized by the Board of Education, and its certificate accepted as a guarantee of the fitness of the holder to act as a teacher in a certified blind school. Fellowships are granted by the College to members whose long and distinguished service in the cause of the education of the blind is considered worthy of such recognition.

Curriculum of a School for the Blind. The rapid improvement in the mental and physical condition of the blind observable in recent years is doubtless largely owing to the efforts of the late Sir Frances J. Campbell, who, whilst Principal of the Royal Normal College of Music for the Blind, Upper Norwood, gave PHYSICAL EXERCISES a prior place in the school curriculum. Now, every good blind school or institution has a well-equipped gymnasium, and also its kindergarten, where the little ones combine physical development with mental training. Free exercises and dancing are consistently taught; and outdoor games, including cricket and football, encouraged. By means of a specially constructed running track, foot-racing is indulged in; and this is one of the most useful methods of developing confidence and self-reliance, so essential to the after success of the blind if they are to move about, especially outdoors, with ease.

Indoor games, such as cards, draughts, chess, and dominoes are played, either among the blind themselves or with sighted friends. Ordinary playing cards are used, the number and suite being marked in Braille. For draughts and chess, the playing squares are sunk in board, and the black "pieces" are slightly roughened on the surface, or otherwise marked, so as to be readily distinguished by touch.

As was to be expected, the exigencies of modern times demanded some system of SHORTHAND for the blind, and Braille is found to meet fully the requirements. A neat little apparatus, the Stansley-Wayne Shorthand Machine, enables a blind stenographer to take notes at the rate of 110 to 140 words per minute.

Although Louis Braille introduced his system into the Paris School in 1829, it was many years before it was officially adopted there, and not till the year 1868 did it reach England. Not until twenty years later, however, was it in any sense universally used in the schools and institutions of this country, chiefly owing to its being considered an arbitrary and impossible system.

Probably nothing has done more to break down the barrier between the blind and the seeing than the modern typewriting machine. Almost every well-educated blind person nowadays is able to use the ordinary standard machine, and many conduct all their business or private correspondence by its aid. TYPEWRITING for the blind was introduced by Mr. W. Hy. Illingworth, headmaster of the Royal Blind Asylum and School, Edinburgh, in 1885; and two or three years later, by using an Edison-Bell phonograph as a dictating medium, a blind pupil of that institution was trained as a correspondence clerk, being the first blind person to

obtain such a position in a mercantile office—a position which she still holds with credit (1920).

For teaching ARITHMETIC, a sort of zinc "slate" is used. This "slate," or tray, contains a large number of star-shaped holes, arranged in lines $\frac{1}{4}$ in. apart in every direction. Each star has eight points or angles, and the figures consist of little square types about $\frac{1}{8}$ in. long. On one end of each type are two points, and on the other end a little bar; and, as each type may be placed in any hole in eight different positions, it is evident that sixteen characters may be obtained by using both ends of the type, thus providing for the nine digits, the cypher, and various other signs required. For algebra, a slightly different type is used. The apparatus is known as "Taylor's Octagonal Board."

GEOGRAPHY is taught by the aid of embossed maps and globes; for juniors, the sand table is most useful.

Technical Education. This generally commences at 16, and includes basket, mat, and brush-making; pianoforte-tuning and repairing; the profession of music; weaving; hand and machine knitting; massage; boot and shoe making and repairing; upholstery; chair-seating; netting; crochet; and allied occupations. Market gardening and poultry-farming are also sometimes taught.

Under the Education Act, 1902 (Part II), education authorities are empowered to contribute to the cost of such industrial training of blind persons over 16; and many such authorities now make full use of this provision, so saving the blind student from the necessity of appealing to the guardians. A further step in this direction was attained in 1906, when the Board of Education expressed their willingness to recognize certain institutions as technological schools, under condition that they complied with the requirements of the Department as set forth in the "Regulations for Day Technical Classes." A substantial capitation grant is paid on the satisfactory report of H.M. Inspector, and this greatly assists in providing efficient instruction.

The National Institute for the Blind, Great Portland Street, London, opened by Their Majesties the King and Queen in 1914, was until then known as the British and Foreign Blind Association. This Association was founded, in 1868, by the late Dr. T. R. Armitage, who by its aid hoped to bring order out of chaos as to methods of education amongst the blind in England, and especially in the vital matter of the types then in use for reading and writing. Dr. Armitage gave the Association, rent free, offices in his town house; paid the clerical staff; and, with large annual gifts, balanced the excess of expenditure over income. Some years later, the offices were transferred to Great Portland Street. The chief work of the Association was the printing and distributing of Braille literature, and the manufacture of all kinds of apparatus used in the education of the blind. In the new premises, erected at great cost chiefly through the munificence and instrumentality of Sir Arthur Pearson, Bart., this work is now being conducted on a much more comprehensive scale, under the title of the National Institute for the Blind.

Gardner's Trust for the Blind. (Offices: 53 Victoria Street, Westminster.) This Trust was created by the will of the late Mr. Henry Gardner, who, at his death in 1879, left the sum of £300,000 (free of

legacy duty) for the benefit of blind persons residing in England and Wales. Grants are made by way of pensions, without restriction of age; whilst other grants as free gifts are made in certain cases. Scholarships are also provided to enable blind students to enter certain schools and colleges.

Conferences. The Conference of Friends and Instructors of the Blind, held under the aegis of Gardner's Trust in 1890, firmly established the Braille system as the chief medium of education in this country; whilst a further Conference under similar patronage, in 1902, appointed a Committee to revise the system of contractions. This Committee, under the title of the British Braille Committee, sat for three years, and produced what is now recognized as "Authorised Braille."

"American Braille" and "New York Point" are adaptations of Braille's system.

Conclusion. The general education of the blind should have, as its guiding principle, "the development of the remaining faculties to compensate for the loss of sight." The old-fashioned, yet still prevalent, idea that loss of sight brings with it compensations in other directions is a fallacy. The one essential to success is a judicious combination of physical exercises and mental training, in the curriculum of every institution for the education of the blind. W. H. I.

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BLIND, THE NATIONAL INSTITUTE FOR THE.

—This was founded in 1868; and, in its own words, the objects are briefly summarized as follows: "To print and distribute books for the Blind, and to supply all kinds of apparatus for their use. To investigate any questions with reference to the education, employment, and well-being of the Blind. To give advice and assistance of every kind to the Blind, and to those concerned with their well-being. To promote the higher education, employment, and well-being of the Blind in every possible way."

Originally known as "The British and Foreign Blind Association," this institution had a first executive council composed of five members totally blind and the sixth partially so. All were able to read by touch, and, after exhaustive inquiries, they decided that the best system for teaching the blind was the dotted system invented by M. Braille (*q.v.*), a professor of the Institution Nationale des jeunes Aveugles, Paris. Dr. Armitage, of the British and Foreign Blind Association, was largely instrumental in securing the adoption of this system in England. The Association took up in a practical manner the preparation of books, magazines, and music in

Braille type, including a Braille magazine, a Braille musical magazine, a Braille literary journal.

In 1913, Mr. (now Sir) C. Arthur Perason, well known in the publishing world, whose own sight had become greatly impaired, joined the council of the Association and, in 1914, became honorary treasurer. He at once took up the task of collecting money to complete and to equip the new building then in course of construction. His efforts were successful; and in March, 1914, the new building was opened by the King, and the Association took its new name, "The National Institute for the Blind." The new building is equipped with improved machinery, and the output of literature for the blind is much greater than before.

The Institute carries on the work of the College of Teachers of the Blind, which was opened in 1907 to promote and encourage the training of teachers of the blind, and to grant certificates which will give such teachers a recognized position as specialists in their work.

Candidates desirous of obtaining the college certificate must hold a school teacher's certificate, or be otherwise recognized as teachers by the Board of Education. Candidates must pass in *five* compulsory subjects: Theoretical knowledge of Braille; practical knowledge of Braille; practical knowledge of arithmetic for the blind; practice of teaching; theory and history of education as applied to the blind; and in *one* optional subject selected from twelve subjects chiefly devoted to handwork for the blind.

Copies of the examination papers in Braille or in letterpress can be obtained at the Institute, Great Portland Street, London, W.1.

BLIND, THE NATIONAL INSTITUTE FOR THE.

—(See BLIND, EDUCATION OF THE.)

BLIND SPOT.—The base of the optic nerve is situated on the retina of the eye, upon which images of objects are focused. When the image of an object falls on the base of the optic nerve, no impression is produced, the spot being quite insensible to the action of light and being, therefore, known as the blind spot. "This blind spot is so large, that it might prevent our seeing eleven moons if placed side by side, or a man's face at a distance of only 6 or 7 feet" (Helmholtz). Illustration: Shut the right eye, look steadily at **A**, place the paper at about 10 in. from the eye, and the black dots will disappear.



A

BLIND, THE TEACHING OF THE.—(See BASKET WORK, THE TEACHING OF.)

BLOCK SCHOOLS.—(See POOR LAW SCHOOLS.)

"BLUE-STOCKINGS" AND EDUCATION, THE.—The function of the cultured coteries of the eighteenth century, known as "Blue-stocking Clubs," was educative rather than educational.

Learned English Ladies. The term "Blue-stockings" (*bas bleus*) has been applied to learned women generally; but at first it belonged specifically to a small group of Englishwomen who aimed at improving social life by substituting intellectual conversation for the prevalent card-playing,

gambling, and scandal. This group included Mrs. Elizabeth Montagu (1720–1800), who in Paris had seen something of the French *salons* and had presided over a *salon* of her own; Mrs. Elizabeth Carter (1717–1806), the one real scholar of the group, friend of Archbishop Secker and Dr. Johnson, and translator of the Greek Epictetus; Mrs. Hester Chapone (1727–1801), friend of Samuel Richardson and author of *Letters on the Improvement of the Mind*, 1773 (Miss Carter, her friend Miss Talbot, and Mrs. Chapone contributed to Johnson's paper, *The Rambler*); Mrs. Elizabeth Vesey, social rather than intellectual; Mrs. Hester Thrale (1741–1821), intimate friend of Johnson, who advised her in the management of her social gatherings; and "Mrs." Hannah More (1745–1833), the most forceful of the group, intimate with Garrick, Johnson, Horace Walpole, and Wilberforce, schoolmistress, writer, educationist, and publicist.

The title "Blue-stockings" is explained by Boswell and Mme. d'Arblay as originating in the blue stockings of Benjamin Stillingfleet, one of the most indispensable *habitués* of these intellectual circles.

Outside the actual Blue-stocking clubs, which sprang from the English middle-class, were certain ladies of the aristocracy who, without any kind of pose, pursued learning as a hobby, notably Lady Mary Wortley Montagu (1689–1762) and Lady Mary Hervey (1700–1768). The former taught herself Latin and translated the *Enchiridion* of Epictetus from a Latin version. On her return from Constantinople, where her husband had been ambassador, she introduced into England inoculation against smallpox. Lady Mary Hervey, as Lord Chesterfield acknowledged, understood Latin perfectly, studied Rousseau's *Emile*, corresponded with the Scottish philosopher Hume, and received the French philosopher Helvétius. Neither woman claimed higher education for women on grounds of equality with men. Lady Mary Montagu apologized to Lord Bute for recommending a higher education for his daughters as giving resources in solitude and contentment with a simple life.

Beside these two humanist ladies might be placed the French woman-geometrician, translator into French of Newton's *Principia*—Mme. du Châtelet (1706–1749), the friend of Voltaire. Though not propagandists, these women-scholars demonstrated in themselves feminine capacity for intellectual development.

The Salons. Of outstanding importance in the history of the intellectual forces leading to the French Revolution were the French *bureaux d'Esprits*, in which women of marked social gifts gathered round them the cream of intellectual society. At a time of severe political repression and a gagged Press, the only safe places in France for free discussion were the privileged drawing-rooms of women. The *salons* stood for the mental freedom afforded in England by the clubs and coffee-houses. So great was the influence of the fine ladies in France, that Rousseau admitted that nothing could be done in Paris without the aid of women. In the *salons* developed the critical, inquiring spirit which ultimately expressed itself in the great philosophical and scientific achievement of the French *Encyclopédie*, so destructive to ecclesiasticism and the autocracy of the old *régime*, and on the constructive side working for a reformed *national* system of education. The chief *salonnières* were Mme. du Deffand (1697–1780), friend of Voltaire and Horace

Walpole; Mlle. de Lespinasse (1732-1776), a great intellectual rallying-point for the Encyclopaedists; and Mme. Geoffrin (1699-1777), benevolent and wealthy, who (though she could not spell) was of great social and financial assistance to the less atheistical of the philosophers.

Feminine culture in France, however, reached its greatest height at the end of the century in Mme. de Staël (1766-1817), a towering intellect as well as a social force, of whom Byron said: "She is a woman by herself, and has done more than all the rest of them together intellectually."

Two of the French "blue-stockings" directly interested themselves in education: Mme. d'Épinay (1726-1783), who protected J.-J. Rousseau at the time when his great and provocative work on education, *Émile*, was shaping itself; and Mme. de Genlis (1746-1830), attached to the house of Orleans, herself a fine educator of princes, only surpassed by the great Fénelon, "making them not princes but men," and author of educational works, *Adèle et Théodore* and the *Théâtre de l'Éducation*, affected to some extent by the influence of Hannah More.

A Contrast. But, while the intellectual atmosphere of the *salons* was sceptical and revolutionary, that of the English Blue-stocking Clubs was essentially conservative and marked by middle-class caution. Continuing the social crusade initiated by Addison in *The Spectator*, Hannah More attacked Rousseauism, the French Revolution, Frenchwomen's encouragement of scepticism, and, above all, the one English woman-revolutionary, Mary Wollstonecraft (1759-1797), author of *The Rights of Women*.

Both Mrs. Chapone and Hannah More wrote on education and made a great impression on the public, the more because they were not too advanced for their time. A second edition of Mrs. Chapone's cautious *Letters* was demanded within the first six months. She pointed out the danger of learned women exciting male jealousy and female envy; did not recommend the study of "learned languages" (she herself had studied Latin), unless impelled by a "particular genius," still less of "abstruse sciences." History she recommended, and wrote suggestively on its study. Hannah More's *Strictures* roused some opposition on account of supposed Methodistical tendencies, but eventually gained great hold. The Queen consulted her about the education of Princess Charlotte; and, in 1805, Miss More published *Hints towards forming the Character of a young Princess*.

Her *Strictures* went deeper than Mrs. Chapone's *Letters*. Disclaiming the production of a systematic constructive work on education, she nevertheless advanced vital principles, showing the relation of a disciplined intellect to disciplined character, urging women to cultivate the reasoning powers by solid reading—such as Locke's *Essay on The Understanding* and Butler's *Analogy*, and by a study of Arithmetic.

In her anti-slavery protests and, educationally, in her enthusiastic co-operation in the institution of Sunday schools, her friendship for Mrs. Trimmer (the champion of the Charity Schools), and her education of the proletariat by cheap didactic literature, Hannah More made an invaluable contribution to the social and humanitarian movement of the period.

A. WATSON.

BLUNDELL'S SCHOOL, TIVERTON.—Immortalized by Blackmore in *Lorna Doone*, this

school was founded and endowed by Peter Blundell, clothier (*i.e.*, cloth manufacturer), of Tiverton, in 1604. Blundell also established scholarships at Balliol and Sidney Sussex Colleges, where many Old Blundellians continue their education. New buildings in the Tudor style, comprising a chapel, accommodation for 300 boys, laboratories and lecture-rooms, a museum, workshops and engineering rooms, a sanatorium, a gymnasium, a swimming-bath, five courts, and a pavilion, were erected outside the town, in 1882, at a cost of £20,000. The Modern Side has five divisions: Army, Navy, Professional, Scientific and Engineering, and Commercial; there is, of course, also a large Classical and Literary Side. The school endowment allows over £600 a year to be allotted to leaving scholarships and exhibitions. In 1908 the school won the Public Schools Shield for Gymnastics. The O.T.C. is large and efficient, and the shooting accommodation comprises an 800-yards' range with four targets, a miniature range fitted with Solano battle-practice targets, and a sub-target shooting machine. Among former scholars were Archbishop Temple, Bishop Conybeare, the novelist Blackmore, and his hero Jan Ridd.

BOARD OF EDUCATION (Whitehall, London).—In April, 1839, an Order in Council was issued directing the formation of a Committee in Council to administer the education grant which had amounted, in 1833, to £20,000, for the assistance of the National Society and the British and Foreign School Society in building schools, and £10,000, in 1835, for the erection of training schools. In 1839 the grant was raised to £30,000, and the Committee proposed to administer the grant itself instead of handing it over to the two societies. It also ordered that no grants would in future be made for the establishment of schools, unless the right of inspection was retained by the Committee. A proposal was also put forward to establish a Government training school, but both Churchmen and Non-conformists loudly opposed the scheme, and it was abandoned until 1846. In 1850, Kneller Hall was opened for the training of teachers, but a few years later was closed as a failure. The Committee of Council on Education did little at first to assist schools, for in the first seven years of its existence it expended only £305,000 out of national funds. There was a widespread distrust of the Committee, and most school managers and proprietors refused both inspection and grant. In 1840 it was agreed that the National Society's approval should be necessary to the appointment of inspectors for its schools; and until the appointment of Matthew Arnold, all inspectors of Church schools were clergymen.

Codes. Until 1860, the regulations of the Committee were issued in Minutes, but in that year Mr. Lowe had all the Minutes collected into what was termed a Code. Mr. Lowe, as Vice-President of the Education Department, was a rigid economist, and determined to diminish the amount paid to schools by making payment depend on results. Mr. Lowe's Revised Code did much to retard progress in elementary education by reducing school building and expenditure on existing schools, and grants fell from £774,700 in 1862 to £635,000 in 1865. These conditions led to the Act of 1870, which established Board Schools, and from that time expenditure continually grew. The Education Acts of 1902 and 1918 (*qq.v.*) led in turn to



Photo by Aerofilms, Ltd.

Air Photo of Cambridge showing Trumpington Street and King's Parade

modifications of the Code, but in neither case was a radical alteration necessary.

A Distinct Organized Department. In 1899, an Act of Parliament established the Board of Education as a distinct Government Department, consisting of a President and a number of Cabinet Ministers. It has a Parliamentary Secretary, a Permanent Secretary, and an Accountant-General. There is also a Permanent Secretary for Wales. The educational branches are Elementary, Secondary, Technological, and Universities. The Board also administers the Victoria and Albert Museum, and the Science Museum at South Kensington; the Geological Survey and Museum of Geology in Jermyn Street, S.W.1; and the Solar Physics Observatory and Royal College of Art, South Kensington. There is a large staff of inspectors and sub-inspectors for elementary schools; inspectors of secondary schools, technical institutes, and training colleges, and also women inspectors and junior inspectors.

Functions. By means of grants from the Board of Education, public money is expended by Local Education Authorities on elementary education, continuation education, secondary education, the training of teachers, and higher instruction in science and art. The Board exercises much control over the local authorities in all matters connected with school building, school attendance, and school accommodation. Among eminent men who have been associated with the Education Department and the Board of Education may be mentioned Dr. Kay, the first Secretary in 1839, afterwards known as Sir James Kay-Shuttleworth; Mr. W. E. Forster, the Vice-President in 1870 and Sir Joshua Fitch (*qq.v.*).

BOARD OF EDUCATION, THE.—The Board of Education (often known as the Education Department) was constituted in 1899 by Act of Parliament for the superintendence of matters relating to Education in England and Wales. By this Statute it is provided that "the Board shall consist of a President, and of the Lord President of the Council (unless he is appointed President of the Board), Her Majesty's principal Secretaries of State, the First Commissioner of Her Majesty's Treasury, and the Chancellor of Her Majesty's Exchequer." It is, however, provided that the Board shall be deemed to be established on the appointment of the President thereof. Office as President of the Board does not disqualify the holder for a seat in Parliament, and one of the Secretaries of the Board may also be elected to, and vote in, the House of Commons. Indeed the Board is usually represented in Parliament by its President and Parliamentary Secretary.

The chief official of the Board is the Permanent Secretary, who is the head of a large staff departmentalized as follows: Accounts, Architect, Legal, Medical, Public Elementary Schools, Secondary Schools, Continuation Schools, Technological Schools, Universities, Teachers' Training, Teachers' Pensions, Special Enquiries and Reports, together with a general staff. There is also a Welsh Department of the Board with a Permanent Secretary, who is independent of the Secretary of the Board, but subject to the direction of the President.

The Board of Education is not a new creation, but the development of an earlier organization. In 1839, an Order in Council appointed a Committee of Council to superintend the application of any sums voted by Parliament for the promotion

of Public Education. This Committee of Council established a system of inspection of schools as a condition of public aid. Later it disbursed grants toward the erection of Training Colleges and for the provision of teachers' houses, of school furniture and apparatus. In 1846 it made grants in augmentation of teachers' salaries, and in 1853 direct payments were made in the form of capital grants for each scholar making a required number of attendances in a Public Elementary School. The Committee of Council was presided over by the Lord President, and the Office of Vice-President was established in 1856. For many years the Vice-President was the responsible spokesman in the House of Commons of the Committee of Council.

Its Work and Power. The development of the Parliamentary Grant system is explained elsewhere (see PARLIAMENTARY GRANTS), but it may be noted here that the Committee of Council used the grants placed at its disposal by Parliament for the development of Elementary Education generally, and for the encouragement of teaching in Science and Art. From the South Kensington Branch of the Committee of Council syllabuses of instruction in Science and Art were issued, and arrangements were made for holding annual examinations in these subjects, upon the results of which payments were made out of Parliamentary grants to the teachers of fixed amounts based on the results of the examination, while medals, prizes and certificates were awarded to the successful students.

In the field of popular education, apart from the Science and Art teaching, the work of the Committee of Council was almost entirely confined to the Public Elementary School. These schools in town and county throughout England and Wales were under the direction locally of either School Boards or of Managers associated with various religious denominations. To these School Boards, and to the Managers, the Committee of Council made grants in aid varying in amount according to the efficiency of the schools as determined on examination by Inspectors appointed and employed by the Committee of Council. The operations of the Committee of Council between the year 1839 and 1899 varied so considerably, both in extent and character, that no complete review can be given within the scope of a short article. As public opinion with regard to education developed, so the functions of the Council were modified. The need for concentration in one State Department and the need for substantial increase in the functions of that Department brought into existence the present Board of Education.

The next great landmark is found in 1902, when the local direction of popular education was vested in County and Borough Councils; the School Boards ceased to exist and the voluntary schools became subject to local control, receiving Rate as well as State Aid. The Education Committees, constituted by schemes prepared by the various Councils and approved by the Board of Education, were vested, by delegation from the Councils, with powers in regard to forms of education other than elementary, and, concurrently, the operations of the Board of Education became more extensive. The Act constituting the Board also endowed it with power to inspect Secondary Schools. Additional powers were conferred by various small Acts of Parliament upon both the Board of Education and upon the Local Authority.

Between 1902 and 1918, the term "Education" received a far more comprehensive interpretation, and the Central Authority and Local Authorities became charged with the physical as well as the mental training of youth.

By the Public Libraries Act, 1919, the powers of the Board of Education were further extended. That Act gave to County Councils power to adopt the Public Libraries Acts, but County Councils are Local Authorities under the Act of 1902, and by virtue of that position are in direct touch with the Board of Education, whose approval must be obtained to certain actions in regard to Public Libraries.

Reference has already been made to the duties of the Board in regard to medical inspection and treatment of children. This duty, which is clearly one of public health as well as of public education, is now discharged by the Board under the direction of the Ministry of Health, the Chief Medical Officer of the Board being also Medical Officer in the Health Ministry. But this is not the only department of State with which the Board of Education is brought into close contact. The expenditure of the Board is of course subject to a large extent to Treasury control. In regard to the administration of Reformatory and Industrial Schools, the Board must co-operate with the Home Office, while Poor Law Schools call for the co-operation of the Local Government Board. In regard to education in agriculture there is pronounced joint action between the Board of Education and the Ministry of Agriculture, while in the training of ex-officers and men the Board co-operates with the War Office.

Assistant Bodies. In addition to the information and advice which the Board of Education obtains from its own Intelligence Department and from its inspectors, it is assisted by two important Advisory Bodies, namely, the Consultative Committee and the Teachers' Registration Council. The Consultative Committee was established by the same Act of Parliament as the Board itself, and in that Act it was prescribed that the Consultative Committee should undertake the duty of forming a register of teachers as well as that of advising the Board on any matter referred to the Committee by the Board. The duty of forming a register of teachers was subsequently taken from the Consultative Committee whose efforts in this direction had not proved successful, and transferred to a Teachers' Registration Council. That Council, in addition to performing its statutory duty of forming and keeping a register of teachers, is charged with the larger duty of securing unification of the teaching profession, and the Board of Education gives sympathetic attention to recommendations from the Registration Council that have this object in view.

Publications. The Board issue Regulations for the guidance of those engaged in the various branches of public education. Some of these must, by statute, be presented to both Houses of Parliament. Others are so presented for the information of both Houses without statutory obligation. These regulations deal with the conduct of Public Elementary Schools, of Secondary Schools and other forms of Higher Education, with the Training of Teachers, and indeed, with every branch of work where the requirements of the Board need observation in order to obtain financial assistance from the State. The Board

further publish from time to time advice to managers and teachers in the form of suggestions. These documents are obtainable from the King's Printer.

A brief résumé of the work of the Board is generally made by its President on presenting the annual estimates to the House of Commons, but a more comprehensive survey is found in the Annual Reports of the Board of Education, while useful particulars of a statistical character are from time to time published.

All letters should be addressed—The Secretary, Board of Education, Whitehall, London, S.W.1., with the exception that letters intended for the Welsh Department should be addressed—The Secretary, Welsh Department, Board of Education, Whitehall, London, S.W.1. In no case should official correspondence be addressed to an individual by name.

The following telegraphic addresses have been registered—

Elementary Branch—"Empower, London."

Secondary Branch—"Secondary Education, London."

Technological Branch—"Instruction, London."

Welsh Department—"Principality, London."

E. G.

BOARDING SCHOOLS.—These are institutions which have long existed in England for providing education as well as board and lodging. The pupils are placed entirely in the hands of the school authorities, who may be public bodies or private individuals. The majority of these institutions provide higher education, and included among them are the great public schools which afford education for children of the wealthier classes. In connection with public school and university education are a large number of preparatory schools, some directly connected with individual public schools, and some under private management, in which pupils are prepared between the ages of 10 and 14 years for entrance into public schools. Many private venture schools, known variously as grammar schools, high schools, and academies, provide similar education, combined, however, with more commercial teaching.

Early Boarding Schools. The earliest boarding schools of the highest class were Winchester (1387), Eton (1440), St. Paul's (1509), and Christ's Hospital (1553); and during the sixteenth century the number was largely increased as a result of the closing of the monasteries. Educational charities in the sixteenth century, and the gifts and endowments provided by wealthy city companies, led to the establishment of many schools, some of which were boarding schools. The eighteenth century saw the rise of orphan asylums, of which the number has grown very rapidly since 1850.

The profits arising from boarding schools, and the facility with which their proprietors could trade upon the ignorance or indifference of parents, led to the multiplication of boarding schools of the types described by Dickens as flourishing in the first half of the nineteenth century (e.g., Creake's School, Dotheboy's Hall, Dr. Blimber's Academy, and the like). Even at that period it did not appear to parents necessary that the schoolmaster to whom they entrusted their sons should be qualified for his work. In reviewing his life at Salem House, David Copperfield said his blood rose hotly because he knew Creake to be "an incapable brute, who

had no more right to be possessed of the great trust he held than to be Lord High Admiral or Commander-in-Chief—in either of which capacities it is probable that he would have done infinitely less mischief.” And in the opinion of Matthew Arnold, Creakle’s School at Blackheath was a type of our ordinary English middle-class schools in 1880.

Boarding Schools for Girls. For the education of girls, nunnery schools existed from an early period; but these were all swept away at the Reformation, and no substitutes were then provided. For the subsequent period, little has been offered for girls but the private venture school, in which there has been a tendency to devote attention to what was considered ornamental to the exclusion of more solid and useful education. The girls’ boarding schools were “academies” or “seminaries,” and aimed at teaching “accomplishments.” Swift complains of, and parodies, the deplorable ignorance of spelling and composition among the ladies of his day. Again, Dickens affords a picture in *The Old Curiosity Shop*, where Miss Monflathers is held up as an example of the lady who kept a “boarding and day establishment,” where she developed the “properties wisely and benignantly transmitted to her pupils, with expansive powers to be roused from their dormant state through the medium of cultivation.” She thought much of “preserving a proper decorum” in her establishment, and her moral training of the girls resulted only in a priggishness which made them look down on all who happened to be poorer than themselves.

Value of Boarding Schools. The writers on education have been much at variance on the value of the boarding school as compared with the day school. Locke preferred a home education as shielding the child from many dangers associated with the congregation of boys whose influence was greater than that of the teachers. Milton’s *Tractate on Education* describes one type of boarding school as he thought it should be. *Tom Brown’s School Days* gives a picture of a typical boarding school of the best sort, but shows many of the objectionable features. Bullying and “fagging” were perhaps less serious than some of the forms of moral contamination which resulted from the boarding-school system. But, on the other hand, the school of the type of Rugby, under Arnold, was a school of honour and nobility of character. The corporate life of a boarding school undoubtedly develops many of the higher virtues; and in the great public schools the “house” system maintains all the traditions of the particular school, and also affords a nearer approach to family life, with opportunities of more local and effective supervision. The value of the house system is seen by the way in which it has been adopted in many large secondary day schools. The dangers and advantages of life in a boarding school are dependent most largely on the fact that the formation of character is so much a result of companionship at every age. Young boys form their characters to a far greater extent by observation and imitation of other boys than by obedience to the precepts of their masters. Quick, in his *Educational Reformers*, speaks against sending boys to private boarding schools, and thinks it is a gain to keep them at home. He urges the need of good day schools, especially for young boys. The rapid building of secondary day schools by county and other education authorities since 1902 tends to satisfy this need, and the boarding school of the inferior type is becoming a memory.

BOARDING SCHOOL BUILDINGS.—(See BUILDINGS, SCHOOL.)

BOARDING SCHOOLS, CATHOLIC.—(See CATHOLIC SECONDARY EDUCATION.)

BOCCACCIO.—(See RENAISSANCE, THE.)

BODLEIAN LIBRARY.—This Library is situated on the west side and near the northern end of Catherine Street, Oxford; and is a noble pile of buildings three storeys high. In the centre is a square tower of five storeys, and the letters T.B. on the cornice of the oriel window of the tower commemorate the work of Sir Thomas Bodley in contributing to the cost of the erection of the structure. The first library originated in a bequest of books left by Thomas de Cobham, Bishop of Worcester, to Oriel College in 1327. Adam de Brome, rector of St. Mary’s, held Cobham’s books for ten years; but, in 1337, the Vice-Chancellor of the University took possession of them. Humphrey Duke of Gloucester, added over 600 manuscripts to the collection between 1439 and 1449. Until this time, the books had been kept in the Old Congregation House on the north of St. Mary’s chancel; but the University succeeded in persuading Duke Humphrey to provide a room at the Divinity School in which to house the “preciose bookes.” Unfortunately, the Reformation brought disaster; and, in 1550, a Commission was appointed to purge Oxford libraries of superstitious books. Many geometrical manuscripts were seized as books of magic, and manuscripts of the Gospels in Greek were condemned as examples of the black art. These priceless treasures were publicly burnt in Oxford; and, in 1556, the library was stripped of all that remained of its manuscripts, even the book-shelves and benches being taken away.

Thomas Bodley. Thomas Bodley came to Oxford as a student in 1559, and was one of the many who lamented the destruction of the old library. Late in life, when possessed of an ample fortune, he set himself the task of fitting up the library once more. He exerted all his influence to obtain from every quarter either books or money to buy books, and he also provided a register to record the gifts. Among the books named in this register is a manuscript of Marco Polo’s travels, with the date 1466 inside the cover showing when “richart de Wideuille” bought it in London. The first collection made by Bodley included books in many languages, covering a wide range of studies. The Library was opened by the Vice-Chancellor in 1602, and the 8th November is kept annually to commemorate the opening day. At once the Library took a prominent place among the attractions of Oxford for students. Being for many years one of the very few large libraries in Protestant countries, it caused many students from Denmark, North Germany, and Hungary to settle in Oxford for the purpose of taking advantage of its books. Between 1683 and 1714 over 200 foreigners were admitted as regular readers, and in more recent years the numbers have been much larger. It is now no uncommon thing for a hundred new readers to be admitted from the United States alone.

The first catalogue was prepared in 1602, and was a quarto volume of 655 pages. James I granted Letters of Patent to the Library and visited it in 1605, examining many of the books and talking in

his learned foolish way about their contents. Bodley intended that the Library should be established on a firm financial basis, and in 1609 endowed it with an annual income of £131 10s. The Library was already growing rapidly; and, in 1610-12, a new wing was added by the founder and named after him. The "schools" of the University were built between 1613 and 1619, forming the block of buildings known as the Bodleian Library; and, step by step, the Library has appropriated all the rooms, until now practically the whole building is filled with books. The third story of the 1619 schools is the Picture Gallery, and is now included as part of the Bodleian.

Benefactors' Bequests. Among benefactors of the Library in Stuart times were Archbishop Laud, who gave 1,200 valuable manuscripts; Sir Kenelm Digby, who gave 238 manuscripts; and John Selden, from whom the Library received 8,000 manuscripts and books. James I promised Bodley the pick of the Royal Libraries; but when Bodley went to Whitehall to fetch the gift, he found that James had already repented, and he came away empty. In 1645, Milton sent a copy of his poems, both English and Latin; but next year it was stolen, perhaps to be destroyed by a cavalier student. The librarian asked Milton to supply another copy, which he did, adding an ode to the librarian. In 1660, Milton's books were all cast out; but the librarian at that time bought them privately, and at his death left them to the Library. In 1667, the Duchess of Newcastle made a gift to the Bodleian of all her works; and, in 1671, sixty-one volumes written by Isaac Casaubon were presented by his son. In 1887, the Library obtained a manuscript of Queen Margaret's Evangel book, consisting of the Latin Gospel passages for use in the Mass on certain days. This was bought for £6 at an auction sale in London. Some hundreds of valuable books printed on vellum have been collected, some dating back as far as 1450; and large numbers of manuscripts have been obtained from the cathedrals, monasteries, colleges, and churches of all parts of the United Kingdom. In fact, the history of the Library, as related in the *Annals of the Bodleian*, is a series of magnificent bequests of books, manuscripts, coins, and pictures, as well as numerous bequests of money, including one of £36,000, in 1841, from Robert Mason, D.D.

In point of size, the Bodleian is now the sixth library in the world; and in the United Kingdom the only larger library is at the British Museum. The Bodleian contains 700,000 volumes of printed matter and about 33,000 volumes of manuscript. The printed books increase at the rate of some thousands annually.

The Picture Gallery. The Picture Gallery contains many of the treasures of the University, including Sir Thomas Bodley's curious iron chest, which he provided to contain the Library's reserve of coin, and in which Charles I found £500 in a time of need. Here, also, are a writing cabinet, with writing materials, which belonged to Edward Hyde, first Earl of Clarendon; a chair, made of timber taken from Drake's *Golden Hind*, and many valuable portraits. Each of the lower floors supplied six "schools," and over the doorway of each school is written, in Latin, in letters of gold, the purpose for which the school was formerly used. These are now reading rooms, but the increase of books and bookshelves is continually reducing the space available for readers.

Duke Humphrey's Library. The oldest part of the Library is the Divinity School, known as Duke Humphrey's Library, founded in 1444 and finished in 1488. To it was removed the University Library, including the Duke's own gifts. As it stands now, it is very much like what it was in Bodley's time. Here Thomas Hobbes came in 1605 to pore with delight over the "outlines of the earth and the star clusters" on two great globes—one terrestrial and one celestial—which stood at the entrance to Duke Humphrey's room.

Part of the Library is open for several hours daily, except on Christmas Day and Good Friday, to be viewed by visitors at a charge of threepence for each person.

BODLEIAN LIBRARY.—(See LIBRARIES OF THE SEVENTEENTH CENTURY.)

BODY AND MIND.—The precise relations of body and mind to each other have been a subject of philosophical speculation for many ages; but whatever they may be, common experience shows that mind and body interact. Briefly, bodily disease impairs mental power and activity; mental strain or worry leads to bodily discomfort. Every change of bodily health is accompanied, in some degree or form, by a change in mental health and power. Children are more susceptible to these changes than adults; and to secure children's mental comfort and activity, their physical well-being should be secured. Hygienic schoolrooms, suitable light, air, and warmth, opportunities for bodily activity, holidays of suitable frequency and length, and systematic oversight of much of their physical activity—these are essential to the children's mental well-being. Dullness, stupidity, inability to learn as quickly as others do, nervous restlessness that militates against concentrated attention, and other failures to do what is required by the teacher are, perhaps, as much due to physical as to mental causes. The modern development of careful attention to health and the medical examination of children tends to discover other causes of "stupidity" than those assumed by the bygone schoolmaster, whose only remedy for all shortcomings was the rod. To-day, if a child shows less mental power than the average child of his age and social condition, the cause is looked for in his physical life, and steps can now be taken to remove many physical causes of mental deficiencies.

BOETHIUS.—The son of a Roman consul; was well trained in philosophy, mathematics, and poetry, and translated into Latin the works of Aristotle, Euclid, and other Greek philosophers. He was the last of the great men of genius of ancient Rome. He held high office at Rome under Theodoric, king of the Goths, and his influence mitigated the severity of Gothic rule in Italy; but at last those whose oppression he had checked brought charges of treason against him, and he was executed (A.D. 525). During his imprisonment, he wrote *De Consolatione Philosophiae*, which, in dialogue form, declares that the great consolation of a philosopher is that a wise God rules the world, and man in his deepest distress should fix his mind on the immortal. He was generally supposed to have been a heathen, but the piety of his philosophy led the Church eventually to consider him a Christian martyr. Alfred the Great translated the *Consolation of Philosophy* into English and gave it to his people as the thoughts of a Christian.

BOETHIUS.—(See ARTS, THE SEVEN LIBERAL.)

BOLIVIA, THE EDUCATIONAL SYSTEM OF.—

To appreciate the progress of education in Bolivia it is necessary to have some knowledge of the ethnography of that country. The population is heterogeneous, as is the case with the other South American nations; and this determines the various grades of culture that are to be found in the people. This fact constitutes the greatest obstacle to uniformity of advancement, and it is on this account that the American Governments—and particularly that of Bolivia—are interesting themselves in endeavouring to unite these various classes into one common body. There are three races in Bolivia, viz.: the Whites, who are the most highly educated; the Half-breeds, who are more numerous; and the third race, consisting of Aborigines, who are greater in numbers than the half-breeds, but more backward in education. Even the Quichuas, who are the best of the natives, cannot come up to the level of the half-castes. These ethnographical differences are disappearing gradually under the influence of the methods adopted in educating the people, and, perhaps, more so on account of the intermixing of the races; but the Bolivian educationists are confronted with a serious problem owing to the variety of languages and dialects used, and there is abundant proof that the use of one language will do more effectually to link up the people than any other means. The Whites and Half-breeds speak Spanish, which is the national language; the natives in the centre and in the South of the Republic speak "Quichua"; those inhabiting the regions in the higher altitudes speak "Aymará"; while various dialects are used by the Andinas, Orientales, and Pampas tribes. Nevertheless, the Government follows the progress of all with impartial solicitude. The action of the Franciscan missionaries has proved valuable in civilizing these tribes, who, once they are converted to the Christian faith, congregate together and form themselves into small villages, and become quite a peaceful and hard-working community. Rough characters, born in the shadow of the forest far from, and without any communication with, the world that feels and thinks, these uncivilized tribes-people at first strongly oppose with all their natural rebellious spirit the labours of the missionaries; but, little by little, they submit to continued teachings, and ultimately become believers in the Faith and gentle in their manners, eventually learning the industrial arts, and engaging in the weaving of textiles, carpentry, ironwork, shoemaking, tailoring, agriculture, etc. These missions have approximately 20,000 converts, and there are about 4,000 children in their schools.

Primary Schools. Rural schools exist for the natives such as the Quichuas, who have some little education, and for the Aymaraes who live in the country, and whose sole labour consists in tilling the ground. The Government tries to improve this instruction by providing special teachers; and there has been established in Umala a normal rural school, in which thirty-two teachers are now being trained, who will, at the end of their training, take charge of country schools. In the towns and villages there are, approximately, 1,000 schools for elementary instruction, having over 2,000 teachers and about 70,000 pupils. Elementary instruction is free but compulsory, in conformity with Article No. 4 of the State Political

Constitution. Its organization is in accordance with the best modern pedagogical principles, and its technical direction is due to the Belgian professor, George Rouma, who introduced the experimental system in public teaching in place of the old verbal system. The general system of instruction in Bolivia is the "gradual concentric," which has replaced with great advantage the "parcelario" system, or the old teaching by parts. In Sucre, there is a normal mixed school, in which teachers of primary instruction are trained. This school is directed by European masters, and it is here that all those who wish to become fully qualified teachers receive their training in the same way as in the most modern European schools. During the few years of its existence, it has given 100 teachers—all Bolivians—to the primary schools. There has recently been instituted in La Paz a special normal course of physical education, also under European masters, for the training of teachers of gymnastics; and also an academy for the teaching of art. A course of manual instruction is given at Cochabamba, and it is attended by all the pupils of the fiscal and municipal schools of that town. One of the best attended and highly-praised sections of the Bolivian Pavilion, at the recent Universal Exhibition at San Francisco, was that of the Bolivian scholars, where many beautiful works from the primary schools were exhibited. Amongst the primary instruction establishments in Cochabamba and La Paz, there are some very good North American Institutes: one outcome of which is that the English language is more generally used, and another that the youths throughout the Republic are encouraged to become enthusiasts in physical exercise and sports. The "Boy Scout's" movement is also meeting with great success. The curricula of primary schools have been copied from the best and most advanced in the world, and adapted to the necessities of the country under the guidance of competent persons, who have specially studied educational matters in Europe.

Secondary and Superior Education. Secondary instruction occupies six years, and embraces all subjects indispensable for a person's complete education. In the principal towns there are splendid colleges, where the tuition is free; but, in order to enter them, students must first pass through the primary school. These colleges have all the equipment necessary for science work, and laboratories for teaching physics, chemistry, astronomy and meteorology, etc., etc. Higher education comprises principally law, medicine, and theology, although other subjects intended for those desirous of following a professional career have been recently introduced. There are now schools of art for workmen, as well as commercial, mining, and military schools; and an agricultural and a veterinary institute in Cochabamba, under the direction of well-qualified foreign masters. Further, there are courses of dentistry, obstetrics, land-surveying, mathematics; and a number of less important subjects are taught in the larger centres of the Republic. In addition, the Government sends periodically, and at its own expense, many young persons of both sexes to foreign universities, in order that they may obtain their degrees and qualify in various particular branches of learning. Many Bolivians, therefore, receive their education in Europe or in the largest American centres; and, after having completed their studies, they return

home to follow their professions, either as military officers, doctors, dentists, school-teachers, accountants, organizers of trade and business, engineers, or artists. In all Bolivian schools and colleges, the study of the English and the French language is compulsory.

As Cochabamba is the most important educational centre in Bolivia, it is interesting to note the following statistics taken from the latest lists issued by the head of that university.

The number of pupils attending the elementary schools of Cochabamba recently was 14,813, and this number was made up as follows—

Municipal Schools	. . .	9,901
Fiscal	„ . . .	4,012
Private	„ . . .	829
Religious	„ . . .	71
		<hr/>
		14,813

Out of the funds allocated for Fiscal schools in Cochabamba, the cost was Bs. 398,884.00; Municipal schools cost Bs. 252,082.47; that is, a total of Bs. 650,966.47, which is equivalent to about £52,077 sterling.

Bolivia has several universities, and spends about £200,000 per annum upon the various means employed for the education of her people (*e.g.*, in universities, colleges, institutes, public libraries, museums, kindergarten and other schools, etc.). In conclusion, therefore, it may be said that the educational system of Bolivia is doing everything possible to assist the progress of the nation; and that Bolivians, in the realms of art, literature, science, and politics, are manifesting the mental vigour of a yet young race, which goes forward resolved to conquer the future, thanks to the advance of education and the privileges with which Nature has endowed it. A. O.

BOLOGNA, THE ROYAL ACADEMY OF SCIENCE OF THE INSTITUTE OF.—The Academy of the Restless (*Inquieti*), founded by Eustachio Manfredi to foster research and discussion on philosophy and the natural sciences, soon rose to fame. At the beginning of the eighteenth century, the Academy met in the mansion of General Luigi Ferdinando Marsigli, who had also established there an Institute of Science with a valuable collection of books, maps, specimens of natural history, and scientific instruments acquired by him in all parts of the world.

In 1711, General Marsigli endowed the Senate of Bologna with his Institute. As the Academy of the Restless held its sittings in the same place, the Senate fused the Institute and the Academy together. Thus was constituted the Academy of Science of the Institute of Bologna, which was solemnly inaugurated on 13th March, 1714.

In the course of the eighteenth century, it published numerous volumes of *Commentaries*, some containing dissertations of capital importance and value, such as those which treat of Animal Electricity contributed by Luigi Galvani. Enriched by the Cospi and the Aldrovandi museums in 1742 and 1743, and favoured by the wide liberality of Pope Benedict XIV, the Academy displayed a fruitful activity during the whole of the eighteenth century until it was transformed, with new statutes, into the National Institute of the Cisalpine Republic (*Istituto nazionale cisalpino*) by a decree of the Council of the Republic, dated 14th May, 1797.

It was inaugurated in January, 1803, in its present habitation to which the university was also transferred.

Certain members of the Academy of Science, however, who were not elected to the Institute, continued to carry on in a certain fashion its former activities. The Minister of the Interior intervened on 19th April, 1804, and suppressed it.

The National Institute came to an end by the law of 25th December, 1810, which founded the Royal Italian Institute of Science, Literature, and Art, with its seat at Milan. The new Institute was divided into four branches, one being assigned to Bologna and comprehending in great measure the members of the superseded body. In consequence of the restitution of the Legations to the Pope, Bologna was cut off from the other three cities (which went to form part of the Lombardo-Venetian State), and the Bologna branch was implicitly suppressed.

The old Academy of Science of the Institute, having come to an end in 1797, was, however, resuscitated by papal decree on 4th May, 1829, and has continued since that date an uninterrupted existence. By a decree of March, 1884, it assumed the title of Royal; and, in virtue of another decree of 17th March, 1907, a complementary section of the moral sciences was added, those sections which up to that time had appertained to the Academy being constituted the section of the physical sciences. E. COSTA.

(See also BOLOGNA, THE UNIVERSITY OF.)

BOLOGNA, THE UNIVERSITY OF.—The *Studium* of Bologna had its origin in a school where the law books brought from Ravenna to Bologna were interpreted. Whether it was accessory to another school of liberal arts is uncertain; equally uncertain is the time when it assumed an official character. The law-school definitely existed when the Emperor Frederick I issued the authentic *habita* fixing the rights and privileges of the scholars of Bologna, and calling the four Bolognese doctors (Bulgaro, Martino Gosia, Jacopo, and Ugo) to the Diet of Roncaglia to define the rights of the Empire in its contest with the Italian cities. After the battle of Legnano and the peace of Costanza, the Bolognese School of Law, to which a school of medicine and the arts had been added, supported the Commune.

The Commune at first confined itself to fixing the rules and statutes guaranteeing the scholars' privileges; but, subsequently, it intervened in the appointment and payment of the lecturers and in the distribution of the Chairs. A decree of the Bolognese *Reformatori*, in 1416, assigned the proceeds of the silk and fish duties, and of the taxes on dowries, to the fund for the payment of the lecturers; and when these revenues proved inadequate, they added, in 1437, the duties on trade and part of the salt duties (the so-called *gabella grossa*).

Under Papal Control. In 1506, the city came under the domination of the papacy, but the control of the *Studium* continued to be exercised by the civil magistracy of the *Assunti allo studio* chosen by the Bolognese Senate. But under the pontificate of Sixtus V, and even more markedly under Clement VIII, the interference of the Papal Court and of the legate grew so serious as to reduce the powers of the Bolognese *Assunti* within very narrow limits.

This was one of the chief causes of the decadence of the *Studium* in the second half of the sixteenth

century, and still more in the seventeenth century, when Padua, favoured by the liberal rule of the Venetian Republic, was prospering and flourishing.

In the constitution and history of the *Studium* of Bologna, the three elements which composed it must be considered separately—the scholars, the lecturers, and the doctors.

Student Organization. The scholars were organized in corporations based on a common origin (*nationes*). These *nationes* united at the beginning of the thirteenth century to form wider corporations (*universitates*). The *universitates*, at first, were two; and comprehended students of law only, consisting of cisalpine (three *nationes*) and transalpine students (thirteen *nationes*).

Towards the end of the thirteenth century, or at the beginning of the fourteenth, the students of medicine and philosophy constituted themselves into a *universitas*, which was distinct from the two pre-existing *universitates* of the jurists, and composed also of several *nationes*. Each *universitas* had its own rector elected by the scholars who composed it, the rector being himself a scholar. He exercised civil jurisdiction over the members of the *universitas* and was invested with penal jurisdiction for petty offences; he was assisted by *consiliarii* nominated by the *nationes*. The law students, who at first elected two rectors, one for each *universitas*, elected, in the fifteenth century, one only alternately, from year to year, among the cisalpine and the transalpine students.

The institution of the students' rectorate lasted the whole time the *Studium* was governed by the city, but it rapidly fell into desuetude under papal rule: it disappeared entirely after 1604.

Lecturers and the Colleges of Doctors. The lecturers were at first jurists only, who interpreted the texts of civil and canon law. In the thirteenth century, lecturers in the arts were added, who interpreted the Moorish commentators of Aristotle's works on natural philosophy and Latin texts relating to medicine; others treated of rhetoric, arithmetic, astronomy, and theology. In 1571 a lectureship *de simplicibus* was instituted which was the precursor of the modern Chairs of Mineralogy and Geology (*de fossilibus*), Botany (*de plantis*), and Zoology (*de animalibus*). In 1554, a Chair of Practical Mathematics was instituted; and, in 1564, a new Chair of Higher Mathematics. In 1650, a Chair of Mechanics was added; in 1694, a Chair of Hydro-metry; in 1737, a Chair of Physics and Chemistry. In 1714, the *Studium* was supplemented by the Academy of Science of the Institute (*q.v.*).

The colleges of the doctors were invested with the power of conferring degrees: on students of canon law, after six years' study; on students of civil law, after seven years; on students of medicine, after four years. In the twelfth century, two colleges only existed: one of canon and one of civil law, but in the thirteenth century, the College of Medicine and Arts, and, in the fourteenth, the College of Theology, were added. The members of the college of canon law were 12; of the college of civil law, 16; and of the college of medicine and arts, 15. To become a member of a college, it was necessary to be a citizen of Bologna; and to belong to the most ancient college, that of civil law, the further qualification of having held a professorship for at least three years in the public schools, was necessary.

The conferring of degrees by the colleges took place after an examination before the archdeacon,

who exercised the office of High Chancellor of the *Studium*.

As a consequence of the French invasion, the *Studium* of Bologna (which had come to use officially the term *Archigymnasium* or *University* in place of this ancient designation) was completely reformed. The colleges of doctors were abolished, the granting of degrees being entrusted to commissions chosen by the Government, which took upon itself also the appointment of professors.

Modern History. After a brief interruption, from September, 1799, to June, 1800 (during which, as a result of the victory of the Austrian army, the ordinances prior to 1797 were restored), the University of Bologna was ruled by a provisional decree based on the Constitution of 1797; then, in 1802, by a decree of the *Corps Legislatif* of the Italian Republic, which divided it into three sections on the model of the University of Pavia—Physics and Mathematics, with twenty chairs, Moral and Political Philosophy, with seven; and Literature, with five. Thus reorganized, the University, in 1803, abandoned the seat it had occupied since 1564 in the palace of the Archigymnasium, and transferred itself to the palace of the Academy of Science of the Institute, where it is now.

When, in 1815, Bologna was restored to the Papacy, the Constitution of 1802 persisted in large measure until Pope Leo XII introduced a scheme of general reform for the University of Bologna by virtue of the Bull, *Quod divina sapientia* (28th Aug., 1824), which assigned to the said University forty-one chairs distributed among four faculties (Theology; Jurisprudence; Medicine and Surgery; and Philosophy and Mathematics), and devolved the internal discipline to a rector, who was to be chosen by the Government.

This Constitution lasted until 1859, when, the city of Bologna being freed from papal rule and incorporated in the Italian State, the University was reorganized by a decree of the Governor-General of Romagna, 30th September, 1859, and subdivided into five faculties—Theology (abolished in 1873); Philosophy and Philology; Jurisprudence; Mathematics; Medicine and Surgery. The colleges of the doctors were respected; but, in consequence of the law of 21st April, 1862 (which called in professors not belonging to the University to sit on the examining boards), and of the subsequent law of 31st July, 1862 (which extends to the University of Bologna the rules governing examinations fixed by law on 13th November, 1859), the functions of these colleges, although they still exist, have lost all substantial importance. E. COSTA.

BOLPUR (in Bengal), about 100 miles from Calcutta, is the village where is placed the school founded by Sir Rabindranath Tagore. The school-buildings are known as *Shantiniketan*, or the House of Peace. The school was founded to afford freedom from educational mistakes which the poet ascribed to his own school-days, viz., a sense of uncompromising civil war between his personality and the outer world. Thus Tagore substantially adopts Rousseau's idea of a return to Nature, but includes human nature, as well as external nature, basing both upon a primal sympathy. Tagore believes in sense-training by experience of outward objects in their natural setting. Thus touch is trained by tree-climbing with bare feet, and along with it is learnt the physiognomy of the tree. "Absolute simplicity, and even poverty, is the best education, since living

richly is living mostly by proxy, and thus living in a world of lesser reality." Life is not only physical, mental, moral, but also spiritual; and the spiritual world is not something apart, but the innermost truth of all knowledge. Mysticism is thus implied in education, because it is inseparable from personality. Thus Tagore utilizes the old Hindu institution—the forest colonies, or "ashrams," of the great teachers of the past.

Curriculum and Organization. The education was a kind of life rather than a place of instruction. Instead of the maxim of teaching by "doing," Tagore and his associates hold that education proceeds by "living." They avoid the academic atmosphere and monastic seclusion, but seek to lead a natural life. The teachers are not "mere vehicles of text-books," but find their inspiration in "direct communication of their sensitive minds with the world." Songs of a spontaneous type are written and sung, sometimes in groups by moonlight. Lyrical dramas represent season-festivals. Browning and Shakespeare are introduced, translated into Bengali. Plays are written and even improvised by the pupils. They organize literary clubs and illustrated magazines. In drawing and painting they follow their own bent. Music is voluntarily cultivated. Boys are taught to do their own work, and not to rely on servants. In short, the principles are marked by the freedom of self-activity of Dr. Montessori (*q.v.*), but without any schematic apparatus. They have their own courts of justice.

The school is for 150 boys (from 6 to 17 or 18 years of age, and of all castes), and there are twenty teachers. The head master is elected by the staff yearly. School journeys are organized. All classes are open-air, or on verandahs. The discipline is of a "free" type. Even during examination, boys disperse through the grounds and choose their position for writing answers "even in such inaccessible places as the fork of some high tree." The teaching is bilingual, Bengali and English. The outstanding feature of the school is the attempt "to combine the best traditions of the old Hindu system of teaching with the healthiest aspects of modern methods."

F. W.

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BOMBAY UNIVERSITY.—Was established by an Act of Incorporation passed by the Legislative Council of India in 1857, and reorganized by the India Universities Act of 1904. The faculties are in arts, law, medicine, and engineering. The University is richly endowed with scholarships, prizes, and medals, and has received valuable benefactions from wealthy natives. The library was founded by a gift of two lacs of rupees. A number of colleges, including Elphinstone College and Wilson College, Bombay, and the Deccan College at Poona, are affiliated to the University.

BONAVENTURE.—(See SCHOLASTICISM.)

BONIFACE (A.D. 680–755), whose original name was Winfrid, was educated in Saxon monasteries at Exeter and Southampton; and, in 716,

commenced missionary work among the Germans. He was murdered by the pagans, and afterwards canonized at Rome. His title, Boniface (doer of good), was given him by Pope Gregory II on consecrating him bishop in 723.

BONN UNIVERSITY.—Founded, in 1818, by William III of Prussia, is one of the largest and most modern of the German universities. It is the centre of university education in the Rhine provinces, and has over three thousand students; its faculties include theology, philosophy, law, and medicine. Its students included Helmholtz, Niebuhr, and E. M. Arndt. The ex-Emperor Wilhelm II of Germany, and his eldest son both studied at Bonn. The university has a library of 300,000 volumes and 1,500 manuscripts.

BOOKBINDING.—The advantages of book-binding as a handwork subject may be briefly stated as follows: (1) The end is a thing desired; (2) there is a great variety of manipulations; (3) it is equally suitable for boys and girls; (4) there are splendid opportunities for co-operation between teacher and pupils; (5) it affords a link between school and home; (6) there is facility for easy gradation; (7) the work is easily connected with Art; (8) the materials required are not expensive nor bulky and, in regard to apparatus, there are many opportunities for the exercise of ingenuity. Most of the tools in use in a book-binder's shop, such as sewing frames, presses, and ploughs can be quite easily improvised. Younger children can make their own note, sketch, or drawing books; older children can be taught to bind music or magazine parts, and repair books for home or school use.

Method of Work. To bind, say, a magazine, first break down the "parts" into "sections." Clean all glue off the backs of the sections. Fold sheets of white paper to form end papers and fly-leaves. Fig. (1.) Take a stitching frame and fix three pieces

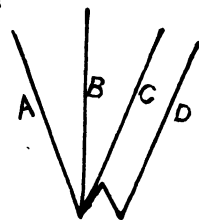


FIG. 1.

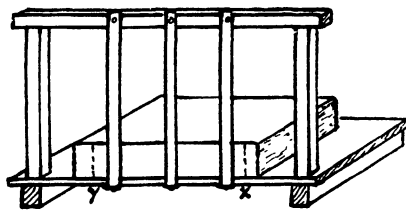


FIG. 2.

of tape to the top rail and base board, as shown in Fig. 2. Mark off the positions of the tapes and the line of the "kettle stitch" (x and y), and take the book off the board. Replace the first end-paper with leaf A in contact with the board. Commence to sew as shown in Fig. 3, the needle being inserted at x , and the line of sewing running between C and D. (Fig. 1.) On reaching y (Fig. 2), put on the first section of the book, title-page down. Push the needle in exactly over the last point of emergence and sew from left to right. When the needle is back at a point exactly over x (Fig. 2), tie up with the

loose end. Put on the next section and repeat the sewing from right to left. Each pair of sections must be firmly fastened together, and what is called the "kettle stitch" is used for this purpose.

The book is now ready for gluing up. Using the wedge-shaped "backing boards," fix up in the press as shown in Fig. 4. Glue the "back" of the book, rubbing well in; leave to set until just past the tacky stage, and hammer carefully in the



FIG. 3.

directions shown in Fig. 4. (For details of procedure, one of the books given as References should be consulted.)

In "half-binding," one piece of cloth or leather (4 in. or 5 in. wide) and $1\frac{1}{2}$ in. longer than the book is used for the back, and two pieces about 4 in. square cut along the diagonals are used for the four corners.

Books may be sewn on cords instead of tapes, and this method of building up gives a more artistic appearance to the finished book. In cord-binding, as cloth cannot be modelled, leather must be used for covering.

The Repair of Books. Books for repair may have lost—or be in danger of losing—their covers, or contain loose or torn pages; music and other sheets

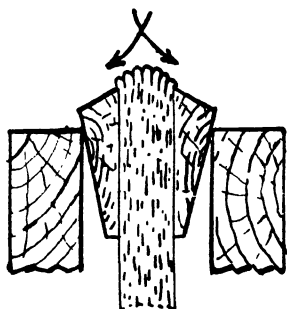


FIG. 4.

for binding may be torn at the back or across the sheets—damage which necessitates repair. The remedy where the book and cover simply require to be re-united is to scrape off old muslin and glue, and treat as for a book at this stage in process of making.

Where cover and book are not completely separated, it

is generally advisable to separate them by cutting the muslin on each side. Where leaves are torn, they may be repaired by means of the transparent adhesive paper stocked by music-sellers.

If the back edges of sheets of music require repairing, strips of strong, thin paper equal in length to the damaged sheets may be used. Fold the strips lengthwise and paste on. These sheets can then be made up into sections and sewn together as usual.

Loose leaves may be inserted by laying a $\frac{1}{4}$ in. strip of paste along the back edge; open the book as widely as possible, place the sheet in position as far into the back as possible, close the book, and leave to set.

It cannot be too strongly impressed on the would-be binder that, in all the operations involved in bookbinding, cleanliness, carefulness, neatness, thoroughness, patience, self-criticism and control are absolutely essential if he would succeed in this most fascinating and highly educational occupation.

J. HALLIDAY.

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BOOK-KEEPING.—In the curriculum of evening schools, book-keeping occupies a prominent position. No doubt its utilitarian value accounts for much of its popularity; but, when properly taught, it calls into play the student's powers of observation, trains his judgment, develops his imagination, and inculcates habits of order and system.

The Teacher. It is a platitude to say that a teacher must have a knowledge of the subject. By this is meant, not a superficial but a full knowledge, which will enable him to see each phase of the subject in its right perspective. A knowledge of cognate subjects, such as Business Training, Banking, and Commercial Law, is also essential, particularly to a teacher of the advanced stages of the subject. In addition to knowledge of the subject, the teacher should be well acquainted with the general principles of teaching. Unfortunately at the present time, many teachers of book-keeping in evening schools hold their appointment by virtue of their practical knowledge only, and hence many instances are found of persons whose knowledge of the subject is beyond question being more or less unsuccessful as teachers. Education committees have often to choose between candidates who have a good knowledge of teaching principles and meagre practical knowledge, and those who have an extensive practical knowledge but little or none of teaching. It would be very advisable if all prospective teachers were required to give some evidence of being conversant with teaching methods, and in this matter the examining bodies could give a lead by including in their examinations for certificates which are regarded as teaching qualifications, a written or oral test (preferably the latter) in methods of teaching.

Equipment of Classroom. For the teaching of book-keeping, little is required apart from the ordinary school furniture, but it is very essential that there should be plenty of blackboard space. It is almost impossible to demonstrate in book-keeping, if only one of the usual square blackboards is used; at least two such boards are necessary. For instance, suppose the teacher is demonstrating the posting of the Sales Book to the Ledger. If only one board is available, the entries will have to be dealt with separately; or, if all the Sales Book entries are placed on the board, it will then have to be cleaned in order that the Ledger entries may be shown. If, however, two boards are provided, the Sales Book entries may remain on one board, while the Ledger postings can be shown on the other. This method is more satisfactory from the teacher's point of view, and it enables the students to follow and understand the procedure easily.

In order to make the lessons more realistic, some teachers use coloured chalk in cases where red ink would be used in business (e.g., for the bringing down of balances; for the insertion of nominal ledger and private ledger balances, etc.). Lantern slides are used with success by a few teachers. The advocates of these aids claim that "for a preliminary lesson this is even better than putting copies of the forms into the students' hands, as the students can view the slides and follow the pointer of the teacher as he indicates the features of the documents, and at the same time listen to the teachers' oral explanation." As, however, the use

of these auxiliaries is impracticable for most teachers, their adoption at present is very limited.

The Lesson. In the elementary stages, preparation will consist chiefly in the arranging in a methodical order of the items to be dealt with, and in selecting suitable illustrative examples. It should be remembered that book-keeping is a subject which is learned by doing, and some time should be spent at each class meeting in the working out of exercises. Normally, the lesson should consist of (1) revision of previous lesson; (2) explanation and illustration of new matter; (3) working exercises; (4) questions and recapitulation; (5) homework. Students should be encouraged to ask questions.

Much discussion has taken place as to the order in which the subject should be taught. Some teachers advocate commencing with the Purchase Book and Sales Book, on the ground that these are the books with which the junior first becomes acquainted in business. Others start with the Cash Book, and argue that this is the book with which students are more or less familiar even before going to business, as many of them have kept a record of their receipts and expenditure of pocket money, or, if at business, have kept the Stamp Book. Others make the Ledger the starting point, on the ground that it is the chief book of account, and its use ought to be known at the outset. In our view, the last is the best method, although perhaps not the easiest. After a few preliminary remarks as to the necessity for keeping books of account, and the meaning of the terms "debtor" and "creditor" (much of which information can be drawn from the class by judicious questioning), it is a good plan to take a few very simple transactions and enter them in Ledger accounts, afterwards drawing up a Trial Balance, Profit and Loss Account, and Balance Sheet. The explanations need be only very simple, and technical terms should be avoided as far as possible. The object of this preliminary survey is to show the pupils the goal at which they are aiming (*i.e.*, the preparation of the final accounts).

The above may seem to some teachers very revolutionary, but that it is quite practicable has been repeatedly proved, and can be accomplished in an hour's lesson. It forms a very interesting introduction and gives, as it were, a bird's-eye view of the subject. In the next lesson, attention could be given to the Ledger; and, as a preliminary, it should be pointed out that in every transaction, two accounts are involved. By taking a number of simple examples and asking the class to name the two accounts affected by each transaction, the teacher will soon find that the pupils understand this point. The teacher can then enter the transactions in appropriate accounts and deduce the rules for debiting and crediting accounts. These rules will then be put in proper form by the teacher and entered in the note-books by the pupils. After the Ledger has been dealt with, the subsidiary books can be introduced and explained. A good deal of controversy has taken place on the question whether the Journal should be used in the early stages of book-keeping. Personally we think it can advantageously be used for two or three lessons mainly for the purposes of explaining the all-important rule of *Dr. and Cr.*, and to allow the pupils to gain facility in the posting of the Ledger. If a pupil can journalize correctly, and post quickly and accurately, he has crossed the *pons asinorum*

of book-keeping. Another point in favour of the use of the Journal in the early stages is that the pupils can be led to understand that, if each transaction is entered therein in chronological order, it must be followed by a narration explaining what the transaction is. It then requires little effort on his part to grasp the fact that if the Journal is sub-divided, and each subdivision used for a particular kind of transaction, a great saving of time is effected. This paves the way for the introduction of the Purchases Book, Sales Book, and Cash Book, the entering and posting of which need cause little, if any, trouble.

It is suggested that difficulties of Arithmetic should not be included in an exercise until the principle underlying the exercise has been thoroughly mastered; for example, when the student is introduced to the Sales Day Book, the items to be entered therein should be fully worked out so that the pupil has merely to copy. When he is familiar with the principle, the arithmetical calculations, such as the working out of prices, etc., might well be introduced.

The exercises given at this stage should be concentrated and short, in order that the student can complete one during a lesson of about fifty minutes. Careful attention should also be given to the early revision exercises to see that, as far as possible, they contain all the points previously taught.

If, during the lesson the teacher notices that the pupils have difficulty in grasping any of his explanations, he should note the fact and endeavour, when repeating the lesson, to find an explanation which will be more readily grasped.

In the advanced stages, more preparation will be necessary in the form of notes, and the teacher will find that he will have to spend considerable time in reading in order to keep up-to-date. Intelligent students frequently bring to class difficulties which have occurred in the particular business in which they are engaged; and, although the questions to which they require immediate answers are sometimes unreasonable, the prestige of the teacher and the confidence of the students in him will be greatly enhanced if he is able to help them out of their difficulties. Advanced classes offer plenty of scope for discussion and, although encouraging it, the teacher must be careful not to allow too much time to be taken up in this way, as, if he is preparing his students for examination, he may find that, although an interesting evening has been spent, the amount of solid work done has been insufficient.

Correlation. Of late years, attempts have been made to correlate book-keeping with arithmetic and with business training. (The latter is dealt with in the article on BUSINESS TRAINING.) With regard to the fusion of book-keeping with arithmetic, it is claimed that the following advantages accrue: (1) it enables all evening students, even those who do not proceed beyond the preliminary course, to gain some acquaintance with the principles on which accounts are kept, the objects of keeping accounts, and the information to be derived from them when kept; (2) it enables the principles of accounts to be developed out of the consideration of problems strictly within the experience, or within the range of imagination of young people whose practical acquaintance with the books of a firm is of the slightest; (3) it tends to re-act upon the arithmetic, and to give it a practical and truly vocational character; (4) it economizes time.

In carrying out this scheme, it will probably be

found necessary, at the outset, to revise the elementary rules of arithmetic, particularly those relating to proportion and vulgar and decimal fractions. The decimalization of money should then receive attention, and this method of working might be used when dealing with the invoice calculations. At this point, the Purchases and Sales Books could be introduced, and the recording of entries therein explained. Consideration should also be given to the making out of debit notes and credit notes, the calculation of the amounts, and the recording of the entries in the Returns Books. When trade and cash discounts are dealt with, an opportunity occurs to revise the pupils' knowledge of percentages, and problems involving the calculation of net prices from gross prices give useful practice. The discussion of discounts leads to a consideration of methods of payment, and, at this stage, an explanation of the functions of cheques and the use of the Cash Book might be undertaken. The necessity of the Ledger having been shown, this book should now receive attention, and the method of posting from the subsidiary books be demonstrated, after which instruction should be given in the making out of a Trial Balance. The drawing up of the Profit and Loss Account presents the opportunity for dealing with calculations relating to percentages of gross and net profit, the percentage of each item of expense to turnover, etc.; while the introduction of bills of exchange suggests calculations in bankers' discount, present value, interest, etc.

The above is merely suggestive, and is confined to the elementary stage only; but teachers will find that correlation can be carried with advantage to the more advanced stages, provided the time allowed for the lessons permits. F. H.

BOOKS, EFFECT OF POPULAR SERIES OF.—

Towards the end of last century a remarkable increase was seen in the serial issue of books intended for the general reader, which has gone on with only one break, caused by the late war, up to the present day. Apart from the rapid growth of the reading public to which this constantly reinforced output pointed, it was, without doubt, distinctly related to the new currents of educational activity, and it is important to take note of the connection between the two.

As a matter of fact, we find in almost every series of reprints not only a marked response to the demand of schools and colleges for text-books, but a tendency to work from the lighter branches of literature to the more solid ones, as it grows sure of its public. And the reaction on the public ought not to be overlooked because the stimulus is often intermittent and cannot be tested by examination tests regularly applied.

History of the Popular Series. If, indeed, we look back into the first records of the "popular series," we learn that it was usually associated by its promoters with some distinct educational aim. Some writers have formed the idea that the cheapening of books to supply the needs of the multitude is an invention of our own day. We should, however, have to go to Edinburgh at the time of Sir Walter Scott and his publisher, Archibald Constable, or to go back to the founding, in 1825, of the "Society for the Diffusion of Useful Knowledge," with Brougham and Hallam among its supporters, to trace its first beginnings. Constable foresaw an immense extension of the good offices of literature

and counted on it with even too sanguine a belief. In his scheme for his *Miscellany*, he looked, as he told Scott, to a public of "hundreds of thousands, ay, millions." At the same time he said; "I'll make it as impossible that there should not be a good library in every decent house in Britain as that the shepherd's ingle-nook should want the *saut poke* (salt-bag)." His *Miscellany* included some books which have often been reprinted in our time, such as Lockhart's *Life of Burns*; but its educational aims were much less marked than those of the more scientific series issued in sixpenny numbers by the "Useful Knowledge" Society. Various publishers continued the work thus begun, including Charles Knight and the Chambers, as the nineteenth century advanced. Then, in its later half and toward its close, two series of books took up the running. These two were the "Clarendon Press Texts" and the "Golden Treasury Series." In the one appeared admirably edited texts of the older poets like Chaucer and Spenser, and of prose-writers like Hooker and Locke, hitherto not readily to be got by the ordinary reader and student. The other series, while it did not tender expressly for the needs of the school-public, may be said to have opened the way for the yet cheaper editions and serial libraries which were to follow. One volume alone, which Francis Turner Palgrave devised and edited—with the aid of no less a collaborator than Tennyson—the *Golden Treasury of Songs and Lyrics*, had an effect in stimulating the taste for lyric poetry which it would be hard for us to over-estimate. This single book, which, since it fell out of copyright, has been reprinted in seven or eight other favourite series, under seal of the democratic shilling, must have gained a reading public not far from Constable's sanguine estimate—one of millions. Its vogue is a fair test of the educative office of the popular edition, since it has been accompanied and followed by a notable demand for the works of the poets it included. Thus, Matthew Arnold's *Selections from Wordsworth* and Stopford Brooke's *Golden Book of Coleridge* have greatly helped to make those authors familiar influences in the commonwealth. It is fair to take poetry as an instance, since it was said, and is still sometimes said, that "poetry is a drug in the market"; and since its influence in urging a finer use of the English language, and preventing the corruption of word and idiom in the common speech, apart from its ideal and imaginative values in life and art, cannot be denied.

Educational Aims and Effects of a Popular Series.

Such editions of the poets as those we have noted, clearly printed, compact in form, and so low-priced that every man can buy a copy, have gone in recent years wherever the English tongue is spoken and helped to maintain in the rising generation the tradition of its nobler and incorrupt usage. The first editor of one popular edition of the English poets was a North-country miner, the late Joseph Skipsey, himself a poet, who believed firmly in the humanizing and liberalizing effect of literature on his own folk. At the time of his activity, the University Extension Movement was making its way into the mining villages of the North; and, thanks to the cheaper books that were put in circulation, small libraries were set up in many country places, and "the college of a village" began to be practicable in its first stages. For evidence upon another side, we might point to the activity of a publisher like the late John Cassell, or an editor like Henry

Morley, in the same widening field. Professor Mackail, speaking to a younger editor than Morley, said recently that he doubted the wisdom of publishing translations of the classics in English—though he has himself translated Homer's *Odyssey*. Henry Morley, with his faith in the taste of the populace for literature, did not hesitate about the growing need for them. Summing up his work in the "Universal Library," he spoke with pride of its sixty-three volumes, which had given to the public English versions of the *Iliad*, of all extant plays of the Greek tragedians, and some plays of Aristophanes; of Sanskrit Fables, and of Virgil's *Aeneid*; also versions of Dante, Boccaccio, Macchiavelli, Rabelais, Cervantes, an adapted Molière, Goethe's *Faust*, and Schiller. We might add that in "Cassell's National Library," he published also volumes of Lucian—to say nothing of Plato, Aristotle, and Longinus. Some of the volumes of the latter miniature series, such as Lucian, have since fallen out of print, which would seem to point to a want of demand for them by the public; but the series itself is still extant.

The Power and Choice of Books. Carlyle's familiar dictum that "the true University of these days is a collection of books," is one that may easily be pushed too far. The ordinary reader who reads to while away a railway journey or a dull Sunday is a haphazard reader. He skims the surface of his author only, as a rule, or reads for sensation or for idle curiosity, and, when that is satisfied, drops the book for some other form of indulgence. But the power of the book is there nevertheless, and it frequently gains in the end on even the fickle mind of the most casual kind of reader. The curious evidence to be gleaned from the numerous letters of half-educated people who write to consult the editor of a popular series about their studies and their intellectual interests, and the large circulation of certain classics in many of our industrial centres, alike prove the vitality of the response in what may be called the provincial public. One series of books, among those which have been most actively propagandist in the cause of good literature of recent years, and which are still current, has made a point of the co-operation of its readers in its choice of authors, with interesting results. Not only schoolmasters and mistresses, ministers of religion and University professors of colleges, who might have been expected to respond, but mechanics and tradesmen in manufacturing towns, miners in the northern coalfield, Scottish and Welsh peasants, and colonists in remote districts of Africa and India, were among those who sent suggestions. A list of *desiderata* sent in by one correspondent alone, writing from the West of England, includes *inter alia*—Erasmus: *Praise of Folly*; Milman: *History of Latin Christianity*; Marner: *Account of the Natives of the Tonga Islands*, 1827 (this was one of the volumes of Constable's *Miscellany*, referred to above); Theocritus; Bion; Moschus; Cowper's *Letters*; Sir J. Fitzjames Stephen's *Essays in Ecclesiastical Biography*; and Spence's *Anecdotes*. This is a mixed batch, and its very composition is significant. It marks the risk that the inexperienced reader meets in the pursuit of literature without guide and without system. However, if this risk is to be counted a positive one, when a popular series of reprints is set up as Carlyle's proverbial university, it is lessened by the issue of complementary handbooks—those popular primers and

literary manuals which correspond on paper to the professor's lectures in the classroom.

If we roughly estimate the number of the series of books and recognized authors found in the "Reference Catalogue of Current Literature" at well over two score, then the companion editions of handbooks and primers may seem to be relatively in rather high proportion. But these "service-books," so to call them, are circulated for the greater part among university students, and among readers who have already had some literary training. Thus, while primers and small books of criticism may help to quicken the understanding of great works and books of all time, their service is not always rendered to those readers who are most in need of it.

The public that these cheap editions can count upon is potentially one of 25,000,000, while a single series has already issued over 700 volumes. Even if we discount freely the surprising circulation to which a so-called popular series of books may attain under this estimate, we have still an audience responsive to the power of the book which asks for fuller consideration by the educationist. The multiplication of books is not enough, unless their reader can be inspired to use them for a freer and surer play of ideas, and for the heightening and what Arnold termed "the criticism" of life. E. R.

BOOKS, SCHOOL.—Before printing, the supply of school books, as of all books, was limited. Until late in the fifteenth century, no schoolboy or student outside the richest class was furnished with any books except those of his own making in the course of his education. All lessons were, as the word itself, a corruption of *lectiones* (lectures or readings). The master alone had a book, from which he read passages which, in the lower forms, the scholars learnt by heart from his recital; while, in the higher, they wrote them down from his dictation. There were no dictionaries and few grammars. Memory and notes were the basis of knowledge. In every town, and in almost any village, a certain number of children at four or five years of age learnt to read from the parish priest or the parish clerk.

A B C's, Primers, and Psalters. At an early date, A B C's were in vogue, which gave the alphabet and the syllables *ab, eb*, and so on, ringing the changes of all the vowels down to *fi, fo, fu* (whence the giants *fi, fo, fum*), followed by the Lord's Prayer, the Ave Maria, and the Creed. From slips of parchment, shaped like the later horn-books (a specimen of which occurs in 1442), the boy learning to read derived the name of *Apesyes* [A B C's] or *Abecedarians*. At six or seven years old, when he could read, the grammar school claimed him. He then became a *Primarian*, or learner of the Primer: a sort of service book doubtfully said by some to take its name from being used at Prime, the service held after Matins at the first hour of the day. This generally contained the seven Penitential Psalms, the fifteen Graduals, and the Hours of Our Lady. This was also used in the Song or Elementary School, as Chaucer in *The Prioress' Tale* describes. The next step was, at Ipswich in 1477, to become what was called a *Saltarian* (i.e. *saltarian*, reading the Psalter).

The Donat. This class was probably identical with that called, at Warwick, in the thirteenth or fourteenth century, the *Donatistas* (Donatists), those learning the Donat, the short treatise on the

Parts of Speech, of Donatus, a Roman grammar schoolmaster, written about A.D. 355. This book the song schoolmasters were forbidden to teach, because it fell within the province of the grammar schoolmaster. It is a terse Latin Catechism: "What is a Noun? A part of speech which is declined, properly or commonly signifying a body or thing. How many accidents has a noun? Six. What? Quality, comparison, gender, number, figure, declension," and so on. The *Donat* was superseded in England in the fifteenth century by the English Latin grammars of John Stanbridge, usher of Magdalen College School, Robert Whittington, and others. They were superseded by the composition in which Wolsey, Erasmus, Colet, and John Lyly (first headmaster of Colet's re-formed St. Paul's School) all claim a share. As the King's Grammar, and from the eighteenth century as the Eton Latin Grammar, it held the schools for some 350 years, till superseded by the Latin Primer in 1870.

The Books of a Grammarian. On leaving the *Donat*, the scholar became a full-blown *Grammarian*. He now entered on Cato, the *Moralia* or *Disticha de moribus*, moral maxims in hexameter couplets. It is a little difficult to understand the intense popularity of this work, which remained the principal lower-form school book down to the eighteenth century. Few of the *disticha* are neat epigrams; like all proverbial philosophy, they are often self-contradictory, and their morality is of the lowest type of self-interest. On the other hand, some had a distinctly educational trend. One of the most quoted in mediæval times is I. 30: *Quæ culpæ soles, cave tu ne feceris ipse; Turpe est doctori, cum culpa redarguit ipsum*; while more popular is the last sentence of the Preface: "Read my precepts with understanding, *legere enim et non intelligere negligere est.*"

To accompany instruction in morals by instruction in manners, the next school-book was the *Regulæ pueriles*, as they are called in a thirteenth-century document, but the *Babees' Book* in a fifteenth-century translation. As edited by Sulpicius, a Roman schoolmaster, in elegant elegiacs in the fifteenth century—known from its first words as *Quos decet in mensa*—it was read in the First Form at Eton in 1530. Dr. Furnivall and later writers regarded these rules as a fifteenth-century product; but they can be traced at least to the *Facetus* or Polite Man of John of Garland, an Englishman, born about 1180, educated at Oxford, an M.A. of Paris, and one of the first Professors in the University of Toulouse. Garland gives in rhyming Latin hexameters all the good old nursery rules: Don't drink or talk with your mouth full; don't wipe your hands on your clothes; don't point; and so on.

Many of Garland's rules are embodied in Clement of Alexandria's *Pedagogue*, written about A.D. 155, giving advice to newly-converted Christians how to behave like gentlefolk.

Virgil and other Latin Authors. From Cato, the next step was to Virgil's *Eclogues*; but as some of them are not precisely proper, for a long time they were supplanted by the *Ecloga* of Theodulus in the ninth century, which tells of a contest in bucolic fashion, between a shepherd Pseustis or Lying, and a shepherdess, Alitheia or Truth. In the end, Pseustis declares himself vanquished. It was commented on by Necham, schoolmaster of St. Albans in the twelfth century, and was among the earliest

printed books in England. It seems to have disappeared from English schools about 1515, being superseded by Baptista Mantuanus, a fifteenth-century friar, whose *eclogues* were supposed by contemporaries to be as poetical as Virgil's without any of his impurities. The next book was Virgil's *Æneid*, which was the book *par excellence* from the beginnings of education in England to the present day. Next in popularity, but far behind, was Lucan. But there were several of the later Christian Latin poets who, up to 1570, ran Virgil hard—Prudentius, Sedulius, and Juvenius. Juvenius versified the Gospels in the middle of the fourth century; it is in his Preface that the common representation of the Evangelists as man, eagle, calf, and lion appear. Sedulius' fifth-century *Paschal Hymn* tells the life of Christ in fine rhetorical hexameters. But far beyond them in popularity was the *Psychomachia* or *Soul-War*, battles of the Virtues and Vices in Seven Fights. It is very dull to us, but to the schoolboy fed up with little but prayers, hymns, and moral discourses, the prancing steeds and shining armour and "bluggy" deeds were a pleasing change.

These Christian authors, however, disappeared from English schools except St. Paul's in the early sixteenth century, their place being taken by Cicero for his rhetoric and Terence, on the ground of his greater utility for vocabulary and colloquial Latin. After 1558, a much wider range of reading was indulged in and, in the upper forms, an indefinite extension followed on the general introduction of Greek in Elizabethan times. A. F. L.

BOOTHAM SCHOOL, YORK.—(See FRIENDS' SCHOOLS.)

BORDEAUX, UNIVERSITY OF.—Founded, in 1441, during the period when the city was under English rule. It was established by a Papal Bull in response to a petition of Henry VI and the inhabitants of the city. Under the Revolution, it was suppressed (1793), but revived in the next century, with faculties of literature and science, to which were added law in 1870 and medicine in 1878. The number of students is about nine hundred, and the institution forms part of the University of France.

BOREMAN'S FOUNDATION.—(See LONDON CITY COMPANIES AND EDUCATION, THE.)

BOROUGH POLYTECHNIC.—(See POLYTECHNICS, THE LONDON.)

BOROUGH ROAD TRAINING COLLEGE.—This well-known residential college dates from 1798, when Joseph Lancaster founded, in the Borough Road, Southwark, a training institution in connection with his School for the Education of the Poor on the lines of his famous "Lancasterian" system (*q.v.*). The success and growth of Lancaster's work led, in 1808, to the formation of the British and Foreign School Society, and the College since that date has been under its control. In 1816 new buildings were erected to meet increasing demands, and in later years these were frequently altered and extended. For some years, both men and women teachers were trained in adjacent buildings; but the growth of the women's side led to their separation and to the opening, in 1861, of the equally well-known Stockwell College for

Schoolmistresses. From 1861 to 1890, men only, therefore, received their training in the College. With the coming of Principal Barnett, the modern era of the College begins. It had long been realized that the Borough Road had ceased to be a desirable neighbourhood; so, in 1890, the institution was removed to Isleworth, where a suitable building in the International School was vacant. After the necessary adaptations had been made, the new College was formally opened by Earl Granville on 13th June, 1890.

The New Buildings. The new Borough Road College is a Gothic building of red and yellow brick, standing in some 10 acres of excellent playing fields and providing accommodation for 140 students with resident staff and the Principal's Lodge. Further additions have since been made to both playing fields and buildings; and the whole, standing on rising ground, commands excellent views of Richmond and the Thames Valley.

Characteristics. Sir Joshua Fitch said: "Wherever I go, I find three characteristics of Borough Road men. In the first place, I find an intellectual life and vigour which distinguishes them, as a rule, from others I know . . . there is a certain enthusiasm, a certain intellectual brightness—what one may call a certain 'go'—which seems to me mostly to characterize Borough Road men. The second characteristic is a great facility for handling large numbers . . . and the third is an affectionate loyalty to the institution." These remarks, uttered in 1880, remain true to-day. Through a hundred years and more, the training has preserved its characteristics of being strict yet not dogmatic, religious yet absolutely unsectarian. Of late years, a very important and successful feature of the academic course has been work for the degrees of the London University. Since the coming in 1809 of one "Tapahoe" from Otaheite, teachers of every colour and religion have been trained here.

Staff and Students. The list of Principals includes Dr. Cornwell, 1839–56; Mr. (afterwards Sir Joshua) Fitch, 1856–63; Mr. J. C. Curtis, 1863–88; Mr. P. A. Barnett, 1888–93; Mr. H. L. Withers, 1893–1900; Mr. Arthur Burrell, 1900–12, and Mr. Hendy, 1912–19. The older generation of students will especially recall Mr. Robert Saunders who served the College from the early '30's until 1875; Vice-Principal Barkby, who entered College in 1859, and remained successively as Tutor, Superintendent, and Vice-Principal until his death in May, 1912. There still remain the well-known Method-master, Mr. G. E. Buckle, with a record of forty years' service; and the Vice-Principal (Dr. Miller), with thirty years' service. Old students include several Members of Parliament and one Minister of State, Dr. T. J. Macnamara; numerous Presidents of the National Union of Teachers; Inspectors of Schools; Directors of Education; Secretaries of Education Committees; University professors; and Principals and Lecturers of newer training colleges.

"Una mente." "Though Seas Divide."

F. F. P.

BOSNIA AND HERZEGOVINA, EDUCATION IN.

—From 1882–1914 education in these countries was under the control of the Austrian Government. Primary education was compulsory, and all education was given in the Serbo-Croatian language, State-aid was given to schools which existed before 1875. Primary schools included the State schools,

a number of the Turkish religious schools, Franciscan Catholic schools, and Serbian schools of the Greek Church. The last three kinds were the chief means of education before 1875, and many of them conformed with the Austrian regulations. At Serajevo there is a training school for teachers, and also a number of secondary schools for boys and girls. The instruction resembled that given in similar schools in Austria. Both states now form part of Yugo-Slavia, and Austrian influence is likely to disappear to a large extent.

BOSSUET, JACQUES BÉNIGNE (1627–1704).—

A famous French orator, and upholder of the Church under Louis XIV. He wrote *Histoire Universelle*, treating history philosophically; and, in connection with religious controversy, the *Doctrine de l'Église Catholique*.

BOTANIC SOCIETY OF LONDON, THE ROYAL.

—This Society, which received its royal charter in 1839, was founded for the promotion of botany in all its branches; its application to medicine, arts, and manufactures; and to aid in the formation of extensive botanical and ornamental gardens upon the site rented from the Crown in Regent's Park.

The Society has created for the London public the opportunities of botanical study within the Metropolis. The grounds are 18 acres in extent, and allow of excellent opportunity for display. Several thousand species of hardy plants; trees, and shrubs flourish in the open air, and some thousands of others in the glasshouses. The garden occupies a spot said to have been reserved for a palace for the Prince Regent, and were laid out by Mr. Robert Marnock, the designer and former curator of Sheffield Botanic Gardens.

Since the laying out of the gardens, the Society has maintained for purely educational purposes: (1) a garden of herbaceous plants; (2) a garden of medicinal and economic plants; and (3) a range of greenhouses, occupying altogether between 3 and 4 acres. The plants are labelled and arranged according to their natural orders and affinities, the greenhouses being devoted to tropical plant life.

A museum of preserved specimens of vegetable products used in food and manufactures was formed, and the Society's officers (without any charge) give to inquirers information and samples. Orders for admission to the gardens are given gratuitously to all *bona-fide* students. These orders are available for three months, and may then be renewed. Annually about 800 such orders are issued. Many medical, scientific, and other schools send their students to study botany in the Society's Gardens, and the Society welcomes parties brought by teachers from elementary schools.

Special Activities. Attention is given to fibre-producing plants, large numbers of which are given, from time to time, to inventors and others, in order that they may test the value of the fibres and experiment with them in cleaning and dyeing.

Many cut specimens are sent annually for investigation and study to hospitals, medical colleges, and the science schools at South Kensington. The supply of botanical specimens in the heart of London has lately become of increasing value owing to the destruction of the open country by the extension of the outer suburbs. Cut specimens are also supplied to art students, who are free to use the gardens for their studies of natural life and colour.

Lectures are given in the Museum during the season on scientific subjects and subjects of national importance connected with the objects of the Society, such as seeds and seed-testing, fertilization and origin of flowers, bulb-growing in Holland and England, etc. All these lectures are published, generally in full, in the Society's *Quarterly Record*, which is sent to the Fellows and Members, and is otherwise widely circulated.

The Practical Gardening School was established in 1897, and includes students of both sexes. The pupils consist chiefly of scholars from elementary schools in London who have obtained scholarships from the County Council, and intend to take up gardening as a profession.

To encourage plant and flower cultivation, the Society holds exhibitions, and lends its grounds for shows such as that of the National Rose Society. During the first sixty years it expended upwards of £50,000 in the award of prizes to successful exhibitors. Its floral fêtes are designed with the object of stimulating the demand for cut flowers and of encouraging a taste for their arrangement in artistic competitions. Many of the prizes are won by professional artists in floral decoration.

Fellows of the Society pay an annual subscription of £3 3s., and Members £1 1s. Fellows have the privilege of admitting one person each on all occasions, or have a book of twenty-five orders admitting two each on any ordinary day.

The *Botanical Journal* is published quarterly, and sent free to all Fellows.

The public are admitted on Mondays and Saturdays at a charge of 1s.; on other days the Gardens are reserved for the use of Fellows and Members.

BOTANY, THE TEACHING OF.—There are few educationists at the time who would wish to deny that Botany has now an acknowledged place in the curriculum of a girls' school. But the results obtained from the study of the subject are often disappointing. Failures in teaching the subject appear to be due largely to a lack of appreciation of the different educational values of the subject at the different stages of development of the child.

Nature Study. With quite young children (say, up to about 11 or 12) the subject is, no doubt, best treated as "Nature Study." Attention should be paid to observing a rational sequence of lessons. The principal object at this stage is to cultivate the powers of observation of the child, and the observations should be recorded as accurately as possible in drawings, not after the impressionist style by brushwork, but as far as possible by detailed drawings. Neatness in every detail should be encouraged, and a simple, accurate drawing praised above a more showy one. The children should describe verbally what they see, and the written work should be mainly limited to the explanation of drawings, for otherwise it may be inaccurate, owing to inadequate knowledge. Every effort must be made to ensure that the written statements shall be clear and to the point; all extraneous and superfluous writing must be discouraged.

The aim of the science teacher at this stage must be to train the eye and hand, and to help the children to be accurate. There is no fear that the subject will prove dull or uninteresting, for their power of observation is far greater than at a later stage, and each child should be kept fully employed with its own specimen. Then, too, the delight the children find when they grow their own seeds, bulbs,

etc., will amply reward the teacher for the time and trouble expended arranging this part of the work.

Observations made in field and garden are naturally of greater value than those in the school-room. There is a tendency at the present time to discourage the making of botany collections. But collecting is a natural instinct which will "out" in children; and though a collection of pressed flowers may perhaps have no greater intrinsic value than a collection of tram-tickets, the educational gain in making the former is enormously greater.

Technical terms should, in general, be avoided; though, when the children feel the want of the word, it is often best to give it. A lesson on the names of the shapes of leaves given by a gifted teacher may prove most satisfactory and profitable to all. There is no fear that the aesthetic nature of the children will not be cultivated, but an appreciation of the wonders and beauties of the natural world is best fostered by a wise and not too-fulsome expression of sympathy on the part of the teacher. It hardly needs to be said that, in the examination of the inside of a flower or of a bud, care should always be taken that the child is not left with the feeling that something beautiful has been destroyed, but rather that the investigation led to the discovery of beauties undreamt of.

The Importance of Field Excursions, and Natural Sciences other than Botany. Perhaps at about 11 or 12 years of age it will be found that the child's logical and reasoning faculties become more strongly marked than its observational powers. The study of botany should then be subordinated to that of the investigation of quite elementary problems in physics and chemistry, though interest in flowers and other natural objects should still be kept up by field expeditions, the keeping of Nature notebooks, etc.

With regard to field excursions, it is of great advantage if the number of pupils taken out at one time does not exceed that which can be kept in close touch with the teacher; but, in any case, and especially with large numbers, some definite object should have been clearly stated before the excursion (e.g., the actual number of kinds of flowers in bloom, the different shapes of leaves, or the different methods of climbing of plants). The Heuristic Method (*q.v.*) is often overdone. It is admirable for acquiring a comprehension of scientific method; but, if it is adhered to too rigidly, unless unlimited time can be devoted to science, the children acquire but little definite knowledge of the physical environment in which they are living. In the years from about 11 or 12 to 14 or 15, they should gain some knowledge of the composition and properties of earth, air, and water, as well as a preliminary training in scientific deduction. They need all this equipment to go on to the study of biological problems.

Plant Physiology. We now come to the second stage in botanical study. If it is not possible to keep up both the physical and biological sides of their scientific studies, it is most important that the latter should not be sacrificed to the former; that is, if we are to aim at preparing really well equipped and useful women. The plant can now be studied as a living organism. The pupils are in a position to carry out simple experiments on plant physiology, but care must be taken that their work is not handicapped by a want of knowledge of simple morphology. It is a good plan to start the year's work with the latter. The pupils should gather up into a

more scientific form those results which they observed in their earlier Nature-study course and in field work. Such a method fits in admirably with an autumn term's work. But the primary consideration at this stage should be elementary plant physiology. The work may include with advantage the observation of a number of floral types, mainly with regard to the question of pollination. If it is at all possible, each pupil should carry out her own experiments on the mode of life of an ordinary green plant. In the hands of a good teacher, the children will acquire a knowledge of the laws of life in a simple, interesting, and yet scientific manner.

Ecology. When possible, this course should be followed by one on the adaptation of plants to their environment, and may include an introduction to systematic botany. The pupils should learn enough about the internal structure of the plant to enable them to understand the modifications of plant structure in adaptation to habitat. The Ecology of the plant should be the keynote now. In this study, the previous knowledge they have gained is all of service. From the Nature study of their earlier years, from observations in Nature note-books, and from field excursions, they should be familiar with the occupants of such regions as woods, moors, and ponds. They can now apply what they know of the life processes of the plant and its internal structure to a better understanding of the characteristic features of such plants.

Place and Importance of Botany in the Curriculum. The first year's study as suggested should on no account be omitted by any pupil in the school. After the first year it may be impossible for botany to be a compulsory subject in the school curriculum. Natural tastes and careers have to be considered; yet there are strong reasons for including the study whenever possible. A knowledge of the marvels and beauties of plant growth adds greatly to the joy of life. The delight in the glories of a carpet of blue-bells in a beech wood in spring is wonderfully heightened when the observer knows something of the processes by which these flowers adapt themselves to life under their peculiar conditions, and a walk through the wood becomes many times more delightful as one looks out for the old friends which one has found before.

Again, when opportunities for travel arise, it is difficult to exaggerate the extraordinary increase in the amount of pleasure and refreshment obtained from the possession of some botanical knowledge. In the higher forms of a school, the kind of botany taught should depend upon the sphere in life for which the girl is being trained. For pupils going on to university work, a very satisfactory course is one on the life-histories of lower plants. A clear, general idea of the Vegetable Kingdom can be obtained from carefully chosen topics. For this, individual microscope work is essential.

For the majority of the girls, those who are likely to enter home life, a course is desirable on the botanical aspects of gardening and agriculture, together with practical work. This should include lessons on the soil, on methods of treating the soil, methods of propagating plants, and the treatment of plant diseases. If the students have gone through the training suggested for previous years, it will be possible to treat these subjects scientifically. The practical work in the laboratory may be under the botany teacher, but it will be a great gain if some of the practical work in the garden can be carried

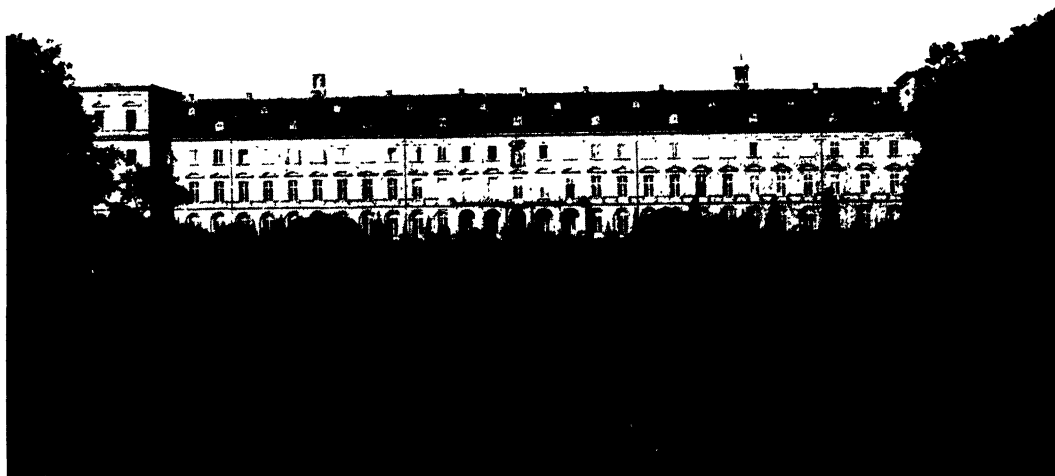
out under an experienced gardener. Such a course should form an essential part of all the "home-life" classes now so general in girls' schools. On leaving school, what a difference it makes if a girl takes a keen and intelligent interest in the garden, whether she adopts the healthy occupation of doing the work herself or only directs the gardener!

By the employment of sound methods in teaching this subject, the hand and eye are trained, and the whole being of the child is made more alert to appreciate Nature. Moreover, the possibilities of literary training afforded by science work are often under-estimated. The pupils may be taught to express themselves simply, lucidly, and straight forwardly, and this will help the formation of a good literary style. A. J.

BOWDLERISED BOOKS.—(See BIBLE IN LITERATURE TEACHING, THE.)

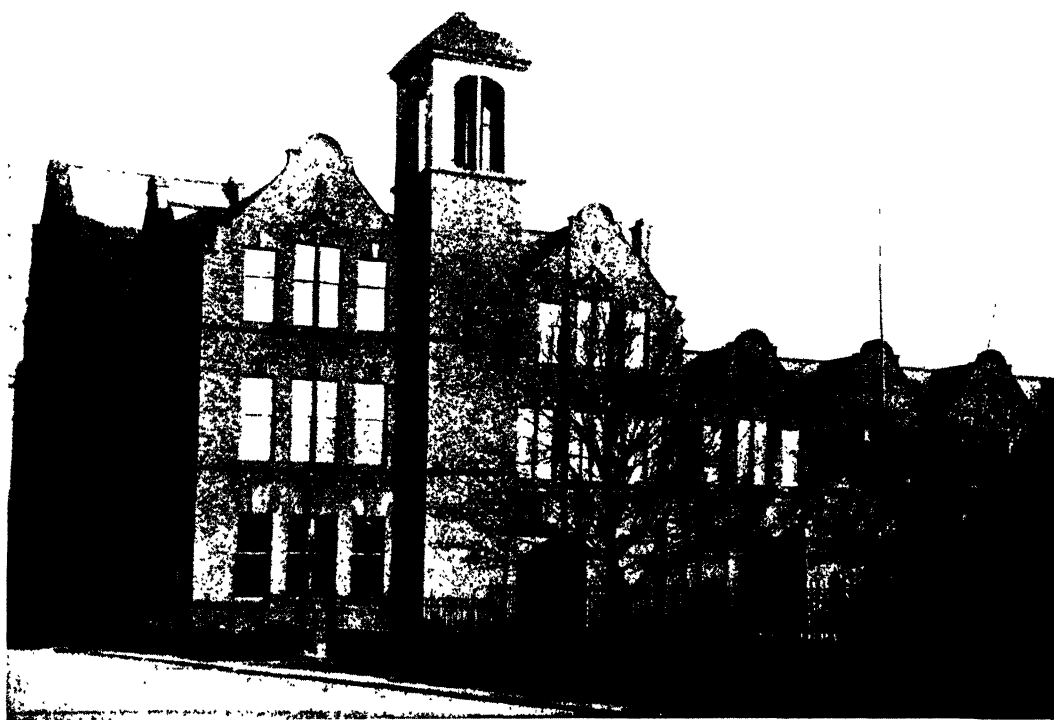
BOWEN, EDWARD ERNEST (1836–1901).—Born at Woolaston, near Chepstow, he became a graduate, scholar, and fellow of Trinity College, Cambridge; and afterwards assistant master at Marlborough and Harrow (1859). As a schoolmaster, he entered into the life of the boys with greater sympathy than was usual, and aimed at interesting boys in their work and creating a friendship between master and pupil. In 1881 he took charge of one of the large "houses" at Harrow, and managed the modern side (created at his suggestion) from 1869 to 1893. Bowen was an enthusiastic sportsman, played cricket and football, and interested himself thoroughly in the Harrow sports, taking part in the games to the last year of his life. He was possessed of great literary gifts; and, besides contributing articles to the *Contemporary Review* and the *National Review*, he composed songs and poems on school life. "Forty Years On" (1872) is the national anthem of Harrow, and depicts the interest of the Old Harrovian in the life of the boys and also his own reminiscences. The Harrow Song Book contains many other of Bowen's poems on the sports and the lighter side of school life. In 1894, Bowen gave evidence before the Royal Commission on Secondary Education. This evidence, with Bowen's songs, and many of his essays, are included in *Memoirs of Edward Bowen*, written by his brother in 1903.

BOWEN, HERBERT COURTHOPE.—An educational leader; was born in Trinidad, 29th August, 1847, and died in London, 9th April, 1909. He was entered at Corpus Christi College, Cambridge (Oct., 1866); and won the Le Bas and the Maitland University Prizes. He taught at Dulwich College and the Central Foundation Schools (Cowper Street, E.C.) and in 1876 he was appointed head master of the Grocers' Company Schools, Hackney Downs, E.C., resigning in 1881. From 1882–1886, he was Principal of the Finsbury Training College, the first institution started in England for the training of secondary teachers. For four years he continued the work; but, in spite of his enthusiasm, the effort got no permanent hold. From 1886 onwards, Mr. Bowen was chiefly engaged in examining for the Joint Universities' Board. But, in voluntary work, he was a most active member of the councils of the Teachers' Guild (of which he was one of the founders), the College of Preceptors, and the Froebel Society (*qq v.*). For about twenty years he was chairman of the National Froebel Union. He



Bonn University

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PLATE XIV

examined at many girls' high schools and was visiting critic at criticism lessons at the Maria Gray Training College, and exercised a remarkably inspiring influence over young teachers. Particularly he was a strong advocate of registration and training, and helped to raise the status of Froebelian teachers. From his pen came the best monograph on *Froebel* (in the Great Educator Series). His educational enthusiasm exercised a great influence in educational societies and in schools, and he did much to help forward the rational teaching of English literature. He wrote a volume of poems: *Blossoms from an Orchard*; but his main writings were educational: *Studies in English*; *English Poems*; *Literature Teaching in Schools*. There is a collection of his educational pamphlets in the Teachers' Guild Library. He was one of the last of the splendid enthusiastic company of the old Education Society (*q.v.*).

F. W.

BOY BISHOP, THE.—(See DRAMA, SCHOOL.)

BOY BISHOP, THE.—(See HOLIDAYS IN OLDEN TIMES.)

BOY SCOUT MOVEMENT, THE.—This was founded in 1908, and at the present time numbers some 300,000 members throughout the British Empire, and has spread to almost every civilized country in the world. The aim of the movement is to give to every boy, and especially the poorest, the opportunity of self-development in the attributes of: (1) Character and intelligence; (2) physical health through self-care; (3) handcraft and technical skill; (4) happiness through realization of beauty in Nature and in art; (5) service for others.

The method adopted is that of active effort on the part of the boy, rather than passive reception of instruction from without. The discipline similarly comes from the inward desire to "play the game" rather than the repressive discipline which comes through fear of punishment.

Scout Promise and Law. The spirit and principles of the training are embodied in the Scout Promise and Law.

PROMISE. "I promise on my honour: (1) To do my duty to God and the King; (2) to help other people at all times; (3) to obey the Scout Law."

LAW. (1) A scout's honour is to be trusted; (2) a scout is loyal; (3) a scout's duty is to be useful, and to help others; (4) a scout is a friend to all, and a brother to every other scout; (5) a scout is courteous; (6) a scout is a friend to animals; (7) a scout obeys orders; (8) a scout smiles and whistles under all difficulties; (9) a scout is thrifty; (10) a scout is clean in thought, word, and deed.

The movement is non-military, non-political, and interdenominational. Service on the part of the officers is voluntary.

The key activity of the Scout Movement is woodcraft, which includes camping, Nature study, and the outdoor life. This is regarded as the most important as well as the most attractive side of the training.

Results. The Boy Scout Movement and that of the Girl Guides (*q.v.*), an organization for girls identical in principle but differing in detail, have become widespread, not only throughout the British Empire, but in almost every civilized country in the world. In America, 500,000 boys and 50,000 girls are undergoing the training, and have, in common with the Boy Scouts and Girl Guides of Great

Britain and elsewhere, carried out valuable public service during the war of 1914-18.

Boy Scout Imperial Headquarters: 25 Buckingham Palace Road, S.W.1. R. B.-P.

BOYS' BRIGADE, THE.—In 1883 the late Sir William A. Smith formed a company of thirty boys in Glasgow and named it "The Boys' Brigade." His object was "the advancement of Christ's Kingdom among Boys and the promotion of habits of Obedience, Reverence, Discipline, Self-respect, and all that tends to a true Christian Manliness." From one small company, the Brigade has grown into a world-wide organization, numbering 70,000 in the United Kingdom alone. For thirty-one years, Sir William A. Smith was Secretary of the Brigade and Captain of the 1st Glasgow Company. He died suddenly in London on 10th May, 1914, having performed a great work which has gained the approval of the nation and the patronage of the King, the Archbishops, and large numbers of other leading men.

The Boys' Brigade consists of companies connected with religious bodies. Each company is under a captain and divided into squads, under non-commissioned officers. The companies in a district form a battalion, under battalion officers. The whole Brigade is under a Brigade Council, with headquarters at 30 George Square, Glasgow.

Boys join the Brigade between the ages of 12 and 17 years, and undertake to attend parade once a week for military drill, and a Bible class usually on Sunday. Other departments include physical drill and gymnastics, ambulance and first-aid work, instrumental bands, sports clubs, signalling and life-saving classes. Some companies have a scouting section, and most spend a week in camp in the summer.

The Boys' Brigade uniform is worn, and badges and medals may be obtained for acts of heroism and for efficiency.

The *Boys' Brigade Gazette* is circulated monthly among the companies, and a large quantity of miscellaneous literature is published to further the Brigade's work.

The London office is at 34 Paternoster Row, E.C.4.

BOYLE, ROBERT (1626-1691).—Seventh son of the first Earl of Cork, and a friend of Hartlib and John Milton (*qq.v.*); had a special talent for scientific research and, in 1660, published his *New Experiments Physico-mechanical, touching the Spring of the Air and its Effects, made for the most part in a New Pneumatic Engine*. Boyle's new engine was the air-pump, and his treatise was followed by others on his experiments in natural philosophy, on colours, flame, and other subjects. In 1674 he published *Observations about the Saltiness of the Sea and The Excellency of Theology compared with Natural Philosophy*. From 1668 he was a member of the Royal Society; and among his scientific discoveries were the use of freezing mixtures, the preparation of hydrogen, and the construction of hermetically-sealed thermometers.

BRACE, JULIA.—A famous blind-mute in the American Asylum at Hartford. She was visited by Dr. Howe in 1841, and in 1842, then 35 years old, she went to his institution at Boston. She was then too old to profit much by Dr. Howe's instruction, but she learnt to spell a few words during the year she stayed with him. (See BRIDGMAN, LAURA.)

BRADFIELD COLLEGE.—In 1850 the Rev. T. Stevens, Rector and Lord of the Manor of Bradfield (Berks), opened St. Andrew's College as a perpetual foundation "for the encouragement of religious and useful learning, and for the careful education of boys as loving children of the Church of England." The school received a royal charter of incorporation in 1862.

The buildings include a chapel, and a large school-house containing a dining-hall capable of seating 210 boys, besides a library, numerous classrooms, four laboratories, and accommodation for masters and boys. There are a gymnasium, an armoury, a carpenter's workshop, an engineering workshop fitted with steam power, two swimming-baths (one covered), and a sanatorium. The whole is surrounded by 40 acres of playing-fields. An Army House for thirty-six, and a Modern House for seventy, supplement the accommodation of the School House; and outside the College grounds stands the Junior School for forty-six little boys from 8 to 12 or 13 years old. There is a flourishing Rifle Corps (O.T.C.).

Three entrance foundation scholarships of the value each of ninety guineas a year, covering all expenses of board and tuition, are awarded annually, besides six or seven exhibitions of lesser value. There are three leaving scholarships, named after the founder, tenable at Oxford or Cambridge, one falling vacant every year.

One of the most remarkable features of Bradfield is the Greek Play, which is performed every third year during the summer term in a beautiful little Greek theatre built in a chalk-pit in the school grounds. The cycle of plays represented is the *Alcestis*, the *Antigone*, and the *Agamemnon*.

Bradfield enjoys a reputation for sound scholarship and high moral training. There are upwards of 300 boys in the school under the charge of about thirty masters.

BRADLEY, GEORGE GRANVILLE (1821–1903).—He was at Rugby under Arnold; and at University College, Oxford, while Arthur P. Stanley (afterwards Dean Stanley) was a Fellow. In 1845 he became a master at Rugby under Tait, a future Archbishop of Canterbury. He became famous as a teacher, and in 1858 was appointed head master of Marlborough, where his pupils gained notable successes in securing University scholarships. The poet Tennyson chose Marlborough as a school for his son that he might be under Bradley. In 1870, Bradley became Master of University College, Oxford, where he lectured on classical poetry and prose. He succeeded Stanley in 1881 as Dean of Westminster, an office which he held till his death. His best known school book is his *Latin Prose Composition*, and he also wrote *Recollections of Arthur Penrhyn Stanley*.

BRAILLE TYPEWRITER.—This is a writing frame, with a grooved metal bed containing ten grooves to the inch. Over the bed is a metal guide, punched with holes, each .3 in. vertically by 2 in. horizontally. The guide is fixed into a wooden frame hinged to the metal bed, and the paper is introduced between the frame and the bed. A blunt awl writes the letters from right to left by being forced through the holes in the metal guide. Little prominences are found on the lower side of the paper when removed, and the writing can be read from left to right. The brass guide has two rows

of openings, so two lines may be written before it is moved lower.

BRAILLE, LOUIS.—(See **BLIND, EDUCATION OF THE.**)

BRAIN, THE.—(See **NERVOUS SYSTEM AND EDUCATION, THE.**)

BRAZIL, THE EDUCATIONAL SYSTEM OF.—Missionaries were the first teachers of Brazil. The Jesuits founded schools in S. Salvador (Bahia) and S. Vicente in 1549 (Father M. da Nobrega).

In 1759, Pombal abolished the institutions of the Jesuits throughout the Portuguese dominions. Their schools in Brazil were superseded by royal schools. Foreign civilizing influences were kept away from the country for political reasons; Armitage describes how foreigners were forbidden to travel in Brazil, and the unfortunate results of isolation in the people's education.

In the upper classes of colonial society, numerous students used to cross the sea to study at Portuguese universities, especially at Coimbra. José Bomfácio, later the "Patriarch of Brazilian Independence," is a good type of the young Brazilian of this generation, owing their culture to Portugal and other European countries, and employing their cultivated powers for the benefit of their own people.

Independent Brazil included, a special article dealing with education in the Constitution of 1824 (Art. 179, § 32), which made all instruction gratuitous. The "Additional Act" of 1834 gave more freedom to the Provinces, but retained for the central government the right to organize higher education throughout the Empire and elementary education in the neutral district of the capital.

The first important step in the organization of public instruction was taken by Viscount Bom-Retiro, in 1854, when the "Inspeccoria Geral da Instrução," the "Conselho Director," the "Delegates," etc., were created. Itaboraahy was the first inspector-general, and his work was most efficient.

The Republican régime found the higher education of Brazil fairly well organized, and did not improve it greatly; elementary and secondary education, on the other hand, were altered. For a short time a special Ministry of Instruction was in existence, with Benjamin Constant B. di Magalhães as Minister. The Pedagogium was founded, and a special review, the *Revista Pedagogica* was established.

The Constitution of 1891 (Art. 35) declares it to be the duty of the Federal Congress to encourage learning throughout the country, without interfering with local government; to organize secondary and higher education in the several States; and to be responsible for secondary education in the Federal District.

In 1901 a reorganization of public instruction was the object of the Código do Ensino, as we shall see later on. Liberal ideals marked the Rivadávia law, or *Lei Organica do Ensino*, of 1911, which provided for the autonomy of the learned corporations, the abolition of the preparatory course before entering the faculties, and of the "equiparação," the institution of a Conselho Superior do Ensino, etc. But the Lei Maximiliano, in 1915, restored the old system with improvements, for the new liberal régime had not proved satisfactory.

Elementary Education. In 1827, elementary schools were established by law in the principa

centres of population of the new Empire. Statistics referring to 1831 show that the schools of Rio had 3,300 pupils.

The Acto Adicional (1834) endowed the Provinces with the right of establishing and directing their own primary education. Legislation in 1851 and 1854 enlarged the elementary programme and divided the schools into two grades, according to the age of the children. This division has been more or less preserved up to the present time. A few years later, the Government granted permission for private schools; and, in 1857, out of 6,918 pupils, 4,415 were in attendance at private schools.

In 1872, the question arose whether primary instruction ought not to be compulsory. Numerous societies were founded, and Menezes Vieira established the kindergarten. The question of ambulant teaching throughout the Provinces was also considered. A Pedagogic Congress in 1885 proposed decentralization and freedom of action as regards education for the several Provinces.

The Republican *régime* reorganized public instruction as a whole, and between 1890 and 1894 each State managed its own elementary schools more or less on the lines of the Rules adopted by the Federal District (11th Oct., 1890).

The division into two grades is maintained. The first grade is for children from 7 to 13 years of age, the second from 13 to 15. The first grade is subdivided into three sections—elementary, intermediate, and higher. Reading and writing, practical Portuguese, arithmetic and the metric system, citizenship, object lessons, drawing, gymnastics, and elementary agriculture are taught. The second grade includes also elementary French, elementary mathematics, physics, and natural history; geography and history; the rudiments of law and political economy; music; and military drill.

The development of primary education is shown in the following table—

Year.	No. of Schools.	No. of Pupils.	No. per 1,000 Inhabitants.
1872 . . .	4,552	139,000	14
1889 . . .	8,157	258,000	18
1907 . . .	12,448	638,000	29
1914 . . .	12,744	700,000	30

Out of 20,570 teachers, primary education employs 15,701.

The largest school populations are found in the following States, according to the *Directoria Geral de Estatística* (1916)—

Minas-Geraes	130,213
S. Paulo	108,939
Rio Grande do Sul	86,272
Federal District	72,022
Bahia	53,432

The official returns of S. Paulo claim 194,106 pupils, and of Minas 138,719.

S. Paulo has progressed according to the following figures—

1904	47,513 pupils
1907	61,084 "
1910	99,203 "
1912	124,316 "

These numbers do not include private schools. Several municipalities (*e.g.*, Ribeirão-Preto) have lately adopted compulsory education.

In the State of Santa-Catharina, a great number of German schools have been established, in which Portuguese is not taught, books and maps being imported from Germany. The local authorities have begun to pay more attention to this significant and important fact. In the State of Rio Grande do Sul, the German element has been more assimilated, so that the situation is different.

Secondary Education. There have been frequent modifications of the scheme of secondary education in Brazil. A certain uniformity has prevailed since the *Codigo do Ensino* of 1901, which adopted definitively the principle of the *equiparação*, or "equivalence," of the diplomas of the various State and private schools, under certain conditions, including inspection.

Brazilian secondary schools may be *equiparados* to the Collegio Pedro II of Rio de Janeiro, which is the model for these institutions, and the only one managed by the Federal Government itself.

The Decree of 15th January, 1894, ordered that the course should extend over seven years, pupils being admitted between 10 and 14 years of age. At the end of the course an examination, called "Madureza," was passed, and the diploma of "Bacharel em Sciencias e Lettras" conferred. The syllabus included Portuguese, Latin, Greek, French, English or German, Mathematics, Physics, Chemistry, History, Geography, Natural Sciences, Sociology, and Ethics.

The Lei Organica (Rivadavia law) of 1911 did not alter the syllabus very much; but effected many changes of *régime*, and minimized the importance of the so-called *preparatorios*, which constituted the basis of secondary education and the condition of enrolment in the high schools.

In 1915, the Lei Maximiliano restored the old system, but reorganized the model Collegio Pedro II in the Federal District. The course now is five years; the age of admission is between 11 and 14; an entrance examination is required; fewer subjects are included in the syllabus, Greek and sociology having been omitted.

During the last twenty years a great deal has been done for national education.

Higher Education. Higher education is still chiefly in the hands of the central Government, but State and private schools have been established since 1889. The Federal authorities manage two faculties of laws (S. Paulo and Recife), two faculties of medicine (Rio and Bahia), and two engineering schools (Rio and Ouro Preto), all of which were established during the Empire.

Certain States maintain faculties, and there are several "Faculdades Livres." Brazil has yet no university, but Art. VI of the Lei Maximiliano (1915) has provided for the creation of the University of Rio de Janeiro, by amalgamating the Escola Polytechnica, the Escola de Medicina, and one of the Faculdades Livres de Direito of Rio. The "rector" will be the president of the Conselho Superior do Ensino.

The full course in law covers five years; medicine and engineering require six years.

The new rules (1915) of *equiparação* are very strict. The application is submitted for approval to the Conselho Superior do Ensino, and the Ministry of the Interior appoints an inspector to make a report on the Academy. A high fee is charged. No school can apply unless the town in which it has been at work for at least two years has a population of 100,000, or is the capital of a State

containing 1,000,000 inhabitants. More than two faculties of the same special branch of knowledge cannot be *equiparadas* in the same town.

In 1916, the well-known Instituto Historico e Geographico of Rio inaugurated the Academia de Altos-Estudos. This high school of political science has been organized on the European model, adapted to fit the requirements of Brazilian administration. It includes three sections: diplomacy, administration, and philosophy.

Technical Education. During the Empire, several agricultural schools and institutes were founded (S. Bento-das-Lages, 1859; Rio de Janeiro, 1860; Sergipe, 1860; S. Pedro de Alcantara, Piahy, 1873). Schools of arts and handicrafts were established in Rio (Bittencourt da Silva) and S. Paulo.

The creation, in 1909, of the Board of Agriculture had great influence in spreading technical education all over the country.

(a) Agricultural training is of three grades: superior (*Escola Superior de Agricultura e Veterinaria*—Rio de Janeiro); secondary (*Escolas Theorico-Practicas de Agricultura*—Bahia, Piracicaba, Pinheiro, Porto-Alegre); and professional or elementary (*Escolas Practicas and Aprendizados Agricolas*—Bahia, S. Luiz-de-Missões, Barbacena, Satuba, Igarapu-Asse, Guimarães, S. Simão, Tubarão, etc.). There are also special schools for stock-farming, dry-farming, rice-growing, cotton-planting, etc. Each State has its own Board of Agriculture and its own special agricultural training organization in accordance with its own needs and revenues.

(b) Industrial education has been taken up lately by the Federal Government, and Schools of Arts and Crafts have been established in the principal towns. State and private schools, called *Lyceus de Artes e Officios*, exist in Rio, Porto-Alegre, Bahia, S. Paulo, Campinas, Maceió, etc. A prominent position in industrial training is occupied by the State of Pará, which manages five well-organized professional institutes in Belem (Instituto Gentil Bittencourt, I. Lauro Sodré, I. de Ourem, I. do Outeiro, I. do Prata). About 1,500 pupils are trained in luxurious and sanitary buildings, which are in every way models of their kind.

(c) Commercial training seems still to be almost entirely in private hands. Several technical schools provide also a commercial course; and book-keeping is generally taught in the *Lyceus de Artes e Officios*. A large and increasing number of students attend the Remington schools.

The chief commercial schools are the *Escola de Commercio Alvares Penteado*, in S. Paulo; the *Academia de Commercio*, in Rio; and the *Escola Practica de Commercio*, in Belem. European methods have been specially studied and adopted by the directors of these schools.

(d) In 1914 there were about 20,600 teachers in Brazilian schools; half were women; 7,265 belonged to private institutions.

The training of teachers is organized by the State, and a training college is to be found in the capitals of the principal States. There are also three municipal colleges (Federal District, Barbacena, and Tres Pontas).

In Rio Grande do Sul, the training is given by the *Escolas Complementares*, and in Minas Geraes by the *Collegios Pedagogicos*.

In S. Paulo, the State manages eight training colleges for elementary teachers, and three for teachers in secondary schools. In 1912, S. Paulo was training 3,611 students. The S. Paulo teachers

have a great reputation in Brazil, and are much sought after by the other States.

C. M. D. DE C.

BREAKDOWN (NERVOUS).—(See ADOLESCENT CHILDREN, THE PHYSIQUE AND STAMINA OF.)

BREATHING EXERCISES FOR CHILDREN.—

It is impossible to over-estimate the importance of teaching a child constantly to breathe through the nose with the mouth closed both by day and by night. Very many cases of deafness and of chronic ear discharge, of deformity of the jaws, of coughs, colds, and chronic discharge from the nose, are directly or indirectly the result of mouth-breathing. But it is a great mistake to assume that every child who constantly keeps his mouth open is suffering from adenoids. Undoubtedly post-nasal growths or adenoids are among the commonest causes of mouth breathing; but swelling of the mucous membrane of the nose, and thickening or deformity of the bones of the nose, may act in just the same way. Moreover, unless special precautions are taken, the habit once acquired is not easily lost, even when the cause is removed; and some of the worst cases of mouth-breathing that I have ever seen had had their adenoids completely removed, and had no obstruction whatever in the nose or throat.

It is the easiest possible matter to get some children to breathe through the nose. Directly the child is taught to blow its nose, the habit is readily acquired. With others, removal of obstruction, breathing exercises, a handkerchief under the chin and over the head at night, and a good deal of care are necessary; and some children only acquire the habit when they are old enough to realize that the constantly open mouth gives them a foolish expression. For inveterate cases, some capable and intelligent person, such as the mother (if there are no other young children), or a governess or nurse, should be with the child every moment both by night and day for some months, and, in addition to giving breathing exercises, should watch the child, wherever he is and whatever he is doing, and make him close his mouth whenever it is seen open. For some days or weeks the child's life will be made a perfect burden to him; but, where the treatment has been conscientiously carried out, I have never known it to fail.

Improper Exercises. It is very important, however, that the right sort of breathing exercises should be taught. At many of the elementary schools in London, the children were, till recently, instructed to breathe in through the nose and out through the mouth; and, whatever value these exercises may have in the development of the chest, from the point of view of nose-breathing they are not only useless but actually harmful. For, as a little consideration will suffice to show, they actually encourage the children in the pernicious habit of breathing through the mouth. Normal respiration consists in inspiration followed by expiration, at the conclusion of which there is a very short period of rest. At the conclusion of expiration with the mouth open, the child finds himself in a position in which a definite muscular action (that of shutting the mouth) is required before starting the next inspiration, if it is to be a correct one; and the result is that there is a tendency for this muscular action to be deferred, and the child starts the next inspiration, as he

finished the previous respiratory cycle, with the mouth widely open. No wonder, then, that so many children from the elementary schools leave them confirmed mouth-breathers. No one can breathe in and out through the nose unless the nose is fairly "clean" (*i.e.*, free from excessive secretion). But it is quite easy to breathe in through the nose and out through the mouth with the nose half full. Each breath taken draws the mucus further back until it falls into the throat, and is swallowed by the child. Breathing exercises such as the above which encourage this are, therefore, most undesirable.

Instruction in Correct Breathing. When any considerable obstruction to nose-breathing exists, this must, of course, first be removed; but I have found that the symptoms produced by a small amount of adenoids may be made to disappear entirely by breathing exercises, constantly enforced nose-breathing, and careful attention to the general health. The breathing exercises should always be preceded by thorough and repeated blowings of the nose. They should be carried out in the open air when the weather is warm and fine, or in as large a room as possible with the windows open. Ten or fifteen minutes given to the exercises two or three times a day are likely to do much more good than a longer time once daily. The child should be taught to regard the exercises as something worth knowing and showing to others, and not in the light of a punishment. In order not to interfere with the movements of the chest, it is better to support the clothing from the waist than from the shoulders while the exercises are being practised.

Many simple physical exercises, such as those described in the Physical Exercise Syllabus of the Board of Education, may be made use of; indeed, as far as nose-breathing is concerned, it matters but little what movements are carried out, provided that the mouth is closed; for the principal value of the exercises of the body and limbs appears to be in increasing the need for air, and therefore encouraging deep breathing, and in keeping up the interest of the child.

If an ordinary healthy person is watched while taking a deep breath, his nostrils will be seen to dilate. This movement is effected by small muscles (the *alae nasi* muscles), which carry out the work quite reflexly and without any conscious effort on our part. These little muscles give a rounded appearance to the side of the nose, and help to give expression to the face. If the front part of the nose be held gently between the finger and thumb, and the muscles put into action by taking a deep breath with the mouth closed, their force can be estimated. They are not strong muscles in any of us, but their action is very important, and anything that can be done to improve their development will assist in establishing proper nose-breathing. The children should be told to keep the mouth closed and to "make faces"; and, when they screw up their noses in such a position that the *alae nasi* muscles are seen to be acting and the nose dilated, tell them to keep as they are and to breathe in. In breathing out again, the muscles of the face are relaxed, and, as the children once more inspire, they should be instructed to screw up their noses again to dilate the *alae nasi* once more. This exercise is a little difficult to teach, because the children tend to pull up the nose as well as to dilate the *alae nasi*, with the result that a certain amount of obstruction to

breathing is temporarily produced. It is, however, in my opinion, a very important one for the children.
S. HASTINGS.

BRECON, CHRIST COLLEGE.—Now one of the two chief public schools of South Wales, the "College of Christ of Brecknock" was founded by charter of Henry VIII in 1541, on the dissolution of the Dominican priory. Some of the school buildings (*e.g.*, the library and dining-hall) are portions of the ancient fabric; and the chapel, of thirteenth-century architecture, is the original chapel of the religious foundation. The old buildings have been much augmented of recent years, and include a chemical laboratory, studies, etc. There are about 100 boys, chiefly boarders. The endowment provides about 12 entrance scholarships and 30 entrance exhibitions, besides 3 leaving scholarships of £40 each; the school also has a preferential claim on 16 valuable scholarships and 16 exhibitions at Jesus College, Oxford. The Bishop of St. Davids is chairman of the governing body. Brecon is beautifully situated in a broad valley amidst fine mountain scenery at the confluence of the Honddu and the Usk.

BRESLAU UNIVERSITY.—This was formed, in 1811, by Frederick III of Prussia, who then united the University of Frankfort-on-the-Oder with the Leopold University of Breslau. The original university was a Jesuit theological institution, but after 1811 its faculties included both Catholic and Protestant theology. There are also faculties of law, medicine, and philosophy. Above two thousand students are annually enrolled, and among its eminent professors were Neumann (history), Bunsen (chemistry), Kirchhoff (physics), and Cohn (bacteriology). The library contains over 300,000 volumes and 3,700 manuscripts.

BRETHREN OF THE COMMON LIFE (or Hieronymites) were a religious order established in the Low Countries to promote a strictly pietistic life, and with a readiness to help especially the poor. The founder of the community was Gerard Groot, of Deventer, where he was born in 1340. Groot was a contemporary at Paris of John Gerson, who became Chancellor of the University. Groot followed Gerson's methods, which included a tendency to a return to primitive Christianity (in contrast to the current scholasticism, in their case a form of pietistic mysticism) and popular preaching in the vernacular. Groot as a philosopher was influenced largely by the writings of the English mediaevalist William of Ockham (who died in 1347). Groot was repelled by the fruitlessness of scholastic disputation, and established a community at Deventer who should serve truth and practise virtue. He brought together a great number of old MSS. of books of the Bible and of the early Fathers. Youths of noble aims came to him and were employed in work, chiefly translation, and Deventer became renowned for its calligraphy, and, later, after the introduction of the printing-press, for even its classical Greek and Latin texts. Groot died in 1384, and was succeeded by Florentius Radewynius, who developed Groot's ideas. Life was led in common; a common purse, the reward for the labour of all individuals, was common to the use of all. Radewynius had studied at Prague, and it is noteworthy that Prague as well as Paris influenced the thought of the Brethren, since it

establishes a connection, through John Huss, with the English John Wycliff. Radewynius made Windesheim, near Zwolle, the centre of the new movement.

In 1402, seven monasteries accepted the rule of Windesheim, and the number quickly increased. Probably the direct educational side of the early programme of these houses of the Brethren of the Common Life has sometimes been over-emphasized; but their general influence it would be difficult to over-rate. Thomas-à-Kempis was one of the Brethren for seven years under the rule of Florentius Radewynius, though he afterwards took the habit of the Common Regular in their ministry at Zwolle, where the saint continued his transcribing of books and pietistic works till he died in his 92nd year. He wrote the *Imitation of Christ*, therefore, while one of the Brethren. This work, called by à Kempis himself "Ecclesiastical Music," was typical of the sense of spiritual harmony and tranquillity, which, as an ideal, permeated the Brethren's house. It may not be technically an educational work; but à Kempis held that "a convent without a library is like a table without food, a garden without flowers, a purse without money." Intellectual humility, however, was the dominant note of the earliest Brethren. Nevertheless, distrust of concentrated study of the liberal arts (except music) left the Brethren not only time for spiritual exercises, but also for a work which they had much at heart—the elementary instruction of the people. Whilst the *Imitation of Christ* represented intensively the idea of piety as the main object of the Brethren, yet, in connection with their houses, schools began to arise—not merely schools for novices, but schools to which suitable children of the general public readily found admission.

Schools of the Brethren. Thus, there are notices of schools established in the Low Countries at Brussels in 1422, one at Bois-le-duc, one at Gouda in 1425, at Liège in 1428, at Ghent in 1429, at Louvain in 1433. The number of pupils is stated to have been very large. At Zwolle, the number is reported at from 800 to 1,000 pupils; at Bois-le-duc, 1,200; whilst at Deventer about 1,501. The record is given as 2,200. As an impression of the work done, the remark may be quoted of the Ghent school, by Badius Ascensius, that "the Belgian youth is gathered together, as if at a great market of literature." It is said that by 1470 there were as many as fifty schools promoted or supervised by the Brethren of the Common Life, and probably this number was doubled within the following half-century.

The whole of North-West Europe was directly stimulated by the Brethren's schools. To name only two—the famous schools of Strassburg and of Schlettstadt received their educational impetus from the Brethren. It was John Sturm (*q.v.*) who made Strassburg School renowned, but he received his school education at the Brethren's school at Liège, and proceeded to the University of Louvain. Sturm's conspicuous success at Strassburg supplies a link of connection with general European history. For Sturm was a Protestant with the pietist tradition of Deventer, joined with the Calvinist theology of Geneva. With Strassburg are associated the traditions of our English exiles during the reign of Queen Mary. Strassburg and the other Swiss towns of refuge stimulated the Puritanism of Elizabethan England. Probably, therefore, English Puritanism owes far more to the Brethren of the

Common Life as a source than is ordinarily supposed. So, too, at Schlettstadt the educationist Jakob Wimpheling (*q.v.*) was born and lived, and protested against corrupt and degenerate friars and classical pagans, and pleaded for an education which should lead to love of our neighbours. The Protestant schools, founded by men like John Sturm and advocated by Jakob Wimpheling, are often described as permeated by *pietas literata*. But the watchword of piety joined with literary study derives back from both of them to the Brethren of the Common Life.

Famous Scholars. The literary aspect of the schools of the Brethren is best illustrated by the consideration of the work of some of the scholars who were taught in their schools. Thus, John Wessel (1419–1489), who has been described as the "second founder of the University of Paris" in the middle of the fifteenth century, and who exercised a remarkable fascination on the scholars of his time, had been a pupil for eight years in the school of the Brethren of the Common Life at Zwolle. Wessel was one of the first of the Brethren to pursue Greek studies in Italy, and as a Church reformer was recognized by Luther. The Brethren clearly worked for the reformation from within that should make Lutheranism itself unnecessary. Rudolph Agricola (1444–1488) was probably the greatest Northern scholar who lived before Erasmus. He studied first at Louvain, afterwards at Pavia and Ferrara, and spent two years in acquiring Greek. He made his deepest impression on Alexander Hégius (1433–1498), a pupil of the Brethren, and afterwards one of their most distinguished schoolmasters at Emmerich and, finally, at Deventer. Such was the progress in the Northern Renaissance that, in 1489, Erasmus, referring to the humanists of Italy—Valla, Filelfo, Aeneas Sylvius (Pope Pius II), Datho, Poggio, Barzizza—does not hesitate to balance that list by the humanists of the North—Hégius, Rudolph Agricola, Cornelius Gerard (to whom Erasmus was writing), Zehender. This latter list is made up either of men who had been pupils from the schools of the Brethren, or who had grown up under influences profoundly affected by the Brethren. Evidently the preparative ground and much of the development towards humanism had taken place before the Brethren's scholars had drunk from the streams of Italian learning, though, in the period covered by Erasmus's life, their classical learning had been quickened enormously by the visits of a few of their leaders to the Greek teachers in Italy. The great test of the development in the Brethren's schools is in the constant improvement in their teaching of Latin, in the classical authors read, and in their classical usage in literary expression instead of mediaeval barbarisms. These progressive factors in the teaching of Latin were, in the Brethren's schools, largely developed by themselves, and were mainly undervived from Italy or elsewhere—except, as already stated, in the early stages, when they were stimulated by Paris and Prague mainly from the side of piety or of religious reform. Perhaps the greatest educational service of the Brethren was the high estimation they put upon the work of teaching. Erasmus wrote adversely on some of the methods practised in their schools at Deventer and Bois-le-duc, in which schools he had been a pupil; but it does not seem improbable that Erasmus himself derived from those schools the spirit in which he said he thought "the

education of youth was the most honourable of all callings."

F. W.

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BRIDEWELL.—A palace rebuilt by Henry VIII on the site of an old Saxon or Norman palace, and was the last of the Whitefriars' monasteries in London. It was used as a palace by Tudor monarchs and, later, as a prison until it was demolished in 1863. In Queen Anne's reign, part of the Bridewell became a hospital for indigent persons: twenty art-masters (decayed traders) lodged there and received 140 apprentices, who, after learning tailoring, weaving, flax-dressing, etc., received the freedom of the City and £10 each.

BRIDGMAN, LAURA (1829-1889).—She was born at Hanover, New Hampshire; and in her second year a weak constitution and long illnesses left her blind, deaf, dumb, and "without that distinct consciousness of individual existence which is developed by the exercise of the senses." In 1837 she entered Dr. Howe's Institution for the Blind at Boston, and was taught elementary subjects, also calisthenics, geography, and astronomy. For many years she kept a diary of events and opinions. Charles Dickens and many other famous people visited her, and for years she was well known throughout the United States as an example of what could be done for the education of the afflicted. Her Life has been written by Maud Howe and Mary Swift Lamson.

BRIDGMAN, LAURA.—(See DEAF-MUTISM AND EDUCATION.)

BRIGGS, HENRY (1560-1631).—Was one of the greatest mathematicians of the seventeenth century. He lectured on geometry at Gresham College, London, from 1596 to 1619, and at Oxford from 1619 till his death. He published the first six books of Euclid in 1620, and, in 1624, *Arithmetica Logarithmica*. He also wrote on the question of the North-West Passage at a time when proposals for its discovery were arousing much attention.

BRINSLEY, JOHN.—Was master of the school at Ashby-de-la-Zouch in the reign of James I and, as a successful schoolmaster of twenty years' experience, published *Ludus Literarius*, or *The Grammar School* in 1612. He wrote also a number of popular school books, with translations of Cicero, Virgil, and Cato, and a Latin grammar called *Posing of the Parts*. His *Ludus Literarius* gives a picture of an English grammar school of the period, with an account of the studies, organization, and teaching. The book is intended to show "how to proceede from the first entrance into learning to the highest perfection required in the Grammar Schooles." It is a practical work, advancing few theories and laying down few principles, but giving the results of the experience and the recommendations of the

writer and other schoolmasters. The work is in the form of a dialogue between Philoponus, who represents Brinsley himself, and Spondeus, a schoolmaster, who visits him and is anxious to learn how Brinsley has succeeded where he himself has failed.

Brinsley advocated the commencement of school at five years of age, but the school should be made a place of play for the young children, who must not be overworked and terrified by the formality of lessons, and who must have a quarter of an hour for recreation in the middle of each morning and each afternoon session.

The pupils were to remain at school till 15 or 16 years of age, when they would be ready for the university. The subjects learnt were Latin (the chief), Greek, Hebrew, the "ground of Religion," and Bible history.

Brinsley gave the teaching of English a more important place in his curriculum than any of his predecessors. He began with the *Abcæ*, or *Primer*, teaching the alphabet, and spelling in the alphabetic way; and the pupils then read the Psalms, the Testament, *The School of Vertue*, and other similar books.

Brinsley also laments the general neglect of arithmetic, which was so little taught that many students, on entering a university, were unable to tell the number of pages and sections in the books they used. A valuable principle, which Brinsley called his "first general observation," was "to teach scholars to understand whatsoever they learn, and to be able to give a reason of everything why it is so." His second observation is equally useful, that scholars should learn only such books and matters as "whereof they may have the best use, and that perpetually in their learnings, or in their whole life."

Brinsley advocated large classes, believing that, if pupils could hear, it was as easy to teach a large as a small group. He encouraged emulation and mutual help, and the co-operation of the pupils in the appointment of monitors, the choosing of sides for school contests, etc.

Brinsley's *Ludus* shows how he carried out his duties as a licensed schoolmaster, in accordance with the rules laid down in 1604 at the Hampton Court Conference.

BRITISH ACADEMY, THE.—After the Revival of Learning, most learned bodies were called academies, and during the seventeenth and eighteenth centuries a large number of these institutions were established throughout Western and Southern Europe, devoted to almost every branch of learning then known. In England, the Royal Academy of Arts was founded in 1768 under the patronage and with the direct encouragement of George III.

The Royal Society for Improving Natural Knowledge the oldest scientific society in England, was established in 1645, and from it sprang many other scientific societies; but until very recent years no academy had existed, and no special provision had been made for literature by a Royal Society.

As the outcome of a meeting of the principal European and American Academies at Wiesbaden in 1899, a scheme was devised for an international association of academies in two sections, one devoted to Natural Science and one to Literary Science. England then possessed the Royal Society as a representative of the first section, but no representative of the second; and at the first meeting of the

federated association the Chair of Literary Science was vacant.

A proposal to add a new section to the Royal Society was not favourably received, and a group of members sent out invitations to prominent literary men inviting them to join in forming a British Academy which should be devoted to historical, philosophical, and philological studies.

The British Academy was formed, and a petition presented for a charter, which was granted in August, 1902. The charter defines the purpose of the Academy as "the promotion of the study of the moral and political sciences, including history, philosophy, law, politics, and economics; archaeology and philology."

Organization and Work. All members are Ordinary Fellows (F.B.A.), and their number is limited to 100. They are under a president, and a council of fifteen elected by the Fellows. Lord Reay was the first president. The work of the British Academy is arranged in four sections, each of which has its own sectional committee, as follows: History and Archaeology; Philology; Philosophy; Jurisprudence and Economics.

The Academy issues papers read at its meetings, first as *brochures*, afterwards in volume form. These are published by the Oxford University Press. Its *Proceedings* form large volumes containing the lectures, and supplementary papers.

In 1910 a new fund was raised to provide for English Language and Literature, and more particularly to provide for the Warton Lecture on English Poetry and the Annual Shakespeare Lecture.

The Inaugural Warton Lecture was given by Professor Ker, and followed by "The Connection between Ancient and Modern Romance" (Dr. Courthope) in 1911, and "The Historical Character of the English Lyric" (Prof. Saintsbury) in 1912.

The Shakespeare Lectures also commenced in 1911 with "What to expect in Shakespeare," followed by "Coriolanus."

In 1910 the council also undertook to reproduce the famous Caedmon MS. of Anglo-Saxon Poetical Paraphrases of the Bible, preserved in the Bodleian Library.

In 1914 was published the first volume of the *Records of Social and Economic History of England and Wales*. It is proposed to publish this series at the rate of three volumes every two years, and Parliament voted the British Academy a grant-in-aid towards the expenses of publication. The series commences with Celtic usages, which form the basis of many institutions and customs of later times. The first volume is entitled "Survey of the Honour of Denbigh, made in 1334"; and it is to be followed by two volumes of "The Black Book of St. Augustine, from a 13th Century MS."; "A Feodary of the Templars, A.D. 1185"; "A Terrier of Fleet, Lincolnshire"; "Documents illustrative of the Social and Economic History of the Dane-law"; and "A Book of Accounts of Bolton Abbey, Yorkshire."

Other publications of the British Academy, the titles of which suggest the nature of the work undertaken, are—

Modern Research as illustrating the Bible, by the Rev. S. R. Davies, 1909; *The Composition of Isaiah in the Light of History and Archaeology*, Rev. R. H. Kennett, 1909; *Early Poetry of Israel*, G. A. Smith, 1910; *History and Civilization of the Philistines*, R. A. S. MacAlister, 1913; *The Jewish and Christian*

Apocalypses, Prof. F. C. Burkett, 1913; *Relation between the Laws of Babylonia and the Laws of Hebrew People* (Warton Lecture), Rev. C. H. W. Johns, 1914.

Professor Skeat was one of the original Fellows, and remained a Fellow of the Academy till his death in 1912. Andrew Lang was a Fellow from 1906 till his death in 1912.

The Fellows hold their meetings in the rooms of the Royal Society at Burlington House, which is the official address of the Secretary of the Academy.

BRITISH ASSOCIATION, THE.—This was founded in London in 1831, and its first meeting was held in York under the presidency of Lord Milton. The objects, as stated in the first report, are: (a) To give a stronger impulse and a more scientific direction to scientific inquiry; (b) to promote the intercourse of those who cultivate science in different parts of the British Empire with one another and with foreign philosophers; (c) to obtain a more general attention to the objects of science, and a removal of any disadvantages of a public kind which impede its progress.

The membership of the Association was, at first, all those who attended the first meeting. To these were added Fellows and members of many chartered societies in England, and officers and members of councils of philosophical institutions.

Since 1831 the Association has held annual meetings, which last a week or more, in many of the chief towns in the United Kingdom and beyond its borders, but not in London, although the permanent office of the Association is in London (Burlington House). The annual meetings are held out of London in order to avoid interference with the work of the many learned societies whose headquarters are there. Some of the meetings were held overseas: at Montreal (1884), Toronto (1897), South Africa (1905), Winnipeg (1909), and Australia (1914).

The administration is carried on by a council, which meets periodically throughout the year, appoints the sectional officers and lecturers, and prepares the annual report.

Work of the Association. In the early life of the Association its work throughout the year was divided between six sections, each with its own committee and officers. The branches of science to which these committees devoted their attention were (1) Mathematics and Physical Science; (2) Chemistry; (3) Mineralogy; (4) Geology and Geography; (5) Zoology and Botany; (6) Mechanical Arts. Through these sections is transacted the bulk of the scientific work throughout the year and at the annual meeting. Their number has increased with the broadening of the interests of the Association and with the specialization of the various departments of science, and at present there are twelve, as follows—

A. Mathematical and Physical Science. B. Chemistry. C. Geology. D. Zoology. E. Geography. F. Economics. G. Engineering. H. Anthropology. I. Physiology. K. Botany. L. Educational Science. M. Agriculture.

It is an important part of the work of the sectional committees to select definite objects of research, and to employ individual or combined action in carrying out research. They also consider branches or aspects of knowledge on which reports are required, and nominate research committees, or appoint individuals, who shall carry out the task of research and make reports. Usually there are

sixty or more research committees at work and their researches cover every branch of science.

The important benefits conferred on the nation by the researches of the British Association have long been acknowledged. The experiments in magnetism and electricity led to the establishment of the electric telegraph, and many other forms of electrical machinery, as well as to a more thorough knowledge of the laws which govern weather and meteorological phenomena. In mechanical science, the results of experiments on the relative strengths of different metals, especially of iron, rendered material service to Stephenson in the erection of the Britannia Tubular Bridge.

The Annual Meeting is the most important part of the work of the General Committee. Only members are admitted to any of the meetings; but, as no technical qualifications are required on the part of an applicant for membership, it is possible to be enrolled as a Member or Associate for the purpose of attending the annual meeting. Members may be enrolled on application to the General Treasurer, Burlington House, W.; or to the local treasurer at the place of the annual meeting.

Life members pay a composition fee of £10, and are entitled to receive gratuitously all reports issued after they have paid the fee. Annual members pay £2 the first year, and afterwards £1 per year. They also receive the report for each year the fee is paid, and are eligible for any office in the Association.

Associates for the annual meeting pay £1. They are not eligible for offices, and may purchase the report at a reduced price.

In 1915, when the annual meeting was held at Manchester, special arrangements were made for teachers in local schools, and students in higher education in the Manchester district, to be admitted as Associates at a reduced fee of 10s. Ladies are admitted as Members or as Associates.

Tickets for the meeting are issued to members only.

A *Journal* is issued containing the sectional programmes for each day, and during the meeting the presidents' addresses and the printed papers of each section are put on sale as soon as possible after issue.

The inaugural meeting is held under the new president, who delivers an address. On the other days there are a conversatione, evening discourses, and a concluding meeting.

The organizing committee for each section determines the papers to be read on each day of the meeting, and authors proposing to read papers submit drafts of their subjects early in the year. The programme of the meeting also includes local visits, entertainments, excursions, and other functions; and a daily *Journal* is issued giving full particulars of the sectional work for each day.

The complete report of each annual meeting is published during the ensuing year, and may be purchased by the public.

The funds collected at the annual meetings provide for the general management, and a surplus which is devoted to promoting research. As early as 1834 a grant of £50 was made for observations and discussions on tides, and in 1868 as much as £1,940 was expended in research grants.

In the list of presidents of the annual meetings are found the names of the most eminent scientists of the last hundred years, including Whewell, Herschell, Owen, Armstrong, Huxley, Tyndall,

Rayleigh, Playfair, Crookes, Dewar, Norman Lockyer, and others well known to the lover of science.

The Educational Science Section. To teachers, the most interesting section of the Association's work is that devoted to educational science. In recent years, great attention has been devoted by the members to every phase and every development of elementary and secondary education.

At the annual meeting of 1913, reports were presented by the sectional committee on the following matters which had been investigated—

1. **THE INFLUENCE OF SCHOOL BOOKS UPON EYESIGHT.** A committee was appointed in 1911, and the whole subject was very exhaustively treated. Inquiries were made, and a report presented on the present practice of local education authorities in England and Wales. The Oculist Committee examined all varieties of school books, and made recommendations on the hygienic requirements to which school books should conform in regard to workmanship, paper, binding, illustrations, ink, type, length of line. Among the special books examined and reported on as likely to be injurious to sight were Bibles, prayer-books, and hymn-books, in which types were usually too small; books of poetry, where cheapness and bad printing were combined; books for evening work; mathematical books, especially with regard to symbols; squared paper; atlases; music; Greek and German texts. The committee prepared specimens of types and printing recommended for children of all school ages.

2. **CURRICULA AND EDUCATIONAL ORGANIZATION OF INDUSTRIAL AND POOR SCHOOLS.**

3. **MENTAL AND PHYSICAL FACTORS INVOLVED IN EDUCATION.**

4. **PSYCHOLOGICAL ANALYSIS AND EDUCATIONAL METHOD IN SPELLING.**

5. **AN INQUIRY INTO SCHOLARSHIPS, etc., held by university students.**

At the same meeting, among the papers read to the Sectional Committee on Educational Science were the following: "The Educational Use of Museums," "The School and the Museum," "An Indian National Alphabet," "Educational Research," "Spelling Reform."

6. **PRACTICAL EXPERIMENTS ON METHODS OF TEACHING READING.** This was an account of experiments made with two classes of students and five classes of elementary school children of average ability. Each class was divided into two sections of about equal intelligence. One section in each class was taught to read English words in Greek script by the phonic method, and the other was taught the same passage by the "look and say" (or word-whole) method. The same length of time was taken over each kind of lesson. Subsequent reading tests were given, with passages—both seen and unseen—and marks given for results. On a comparison of the marks obtained in the two sections, it was found that, on the whole, the phonic method had proved much superior, especially in helping the learners to deal with the unseen passages. But there was some evidence that, for very dull children, the "look-and-say" method might be preferable.

Other subjects dealt with were: "The Excessive Use of Suggestion in Education"; "Mental Differences between the Sexes"; "The Registration of Schools"; "The Need for Experimental Evidence of the Value of Handwork"; "Manual Work in

Education"; "Manual Training in Secondary Schools."

"The Working of the Education Act of 1902." The author of this paper gave conclusions based on his experience gained while he was chairman of the County Council and the County Education Committee of Cambridgeshire."

BRITISH COLUMBIA, EDUCATION IN.—(See CANADA, EDUCATION IN.)

BRITISH GUIANA, EDUCATION IN.—Education of the standard of a British public school is provided for boys at Queen's College, Georgetown. The College is maintained by the Colony, the ruling body being the Governor and the Executive Council, and the instruction is quite undenominational. The course of instruction is arranged to suit the requirements of the Cambridge Local Examinations, extended in the case of the senior boys to a standard equal to that of open scholarships at Oxford or Cambridge. The secondary education of girls is carried on almost entirely by private enterprise. Primary education was established in 1886, and is almost entirely undenominational and State-aided. The central administration is vested in an Inspector of Schools. In 1911 a Board of Education was established, and local control was placed in the hands of managers, who are usually ministers of the religious bodies to which most of the schools belong. Schools are inspected and examined annually, partly by class tests and partly by individual tests; and grants-in-aid are determined by the results. The training of teachers is carried on at Mico College, Jamaica, students being selected by competitive examinations. Pensions are granted to head teachers—men at 60 years, women at 50 years—and also on their becoming incapable by infirmity of mind or body. In recent years, much attention has been paid to agricultural education, Nature knowledge, and school model gardens. Destitute and vagrant children are provided for at the Industrial School in Essequibo, where a hundred boys are usually in residence.

BRITISH MUSEUM.—The Cottonian collection of manuscripts was formed at the close of the sixteenth and in the early part of the seventeenth century. It consisted of Biblical, historical, and literary remains, together with monastic and State records. It passed to the nation in 1700 by the gift of Sir John Cotton, grandson of the founder, Sir Robert Bruce Cotton. By a further Act of a few years later (5 Anne, c. 30), it was provided that Cotton House should be purchased for £4,500 and a new building be erected for the accommodation of the collection. That scheme, however, was not carried through, and for the preservation of the MSS. it was found necessary to remove them. They were transferred in 1712 to Essex House, and remained there until they were again removed, in 1730, to Ashburnham House in Westminster, which had been bought for the purpose of storing in it the Cottonian and the Royal libraries. But they were not fated to remain there long undisturbed. On the 23rd of October, 1731, a fire broke out in the quarters of Dr. Bentley, the Royal librarian, and spread to the rooms containing the collections of books and MSS.: they suffered much injury. Among the MSS. lost were some, valued at £2,000, which Bentley had been collecting for ten years in

preparation for his edition of the Greek Testament. He was observed on the occasion hurrying, in wig and nightgown, from the burning library, carrying the Alexandrine MS. under his arm. A Parliamentary committee which investigated the damage found that out of 958 volumes of MSS., 114 had been totally destroyed and 98 injured. After this untoward event, the Cottonian collection was relegated to the dormitory building of Westminster School. Nothing of importance towards its better safeguard was done until twenty years later, when the MSS. forming part of the collections accumulated by the second Earl of Harley were purchased for £10,000, and the "natural and artificial curiosities" and the library collected by Sir Hans Sloane, were ceded by his executors for £20,000. The Act of 1753 authorizing this expenditure provided that there should be one general repository for the "better reception and more convenient use of the Harleian and Sloane collections, and of the Cottonian Library and additions thereto." This amalgamation of several collections was designated the British Museum and placed under the care of a body of Trustees, of whom the principal ones were the Archbishop of Canterbury, the Lord Chancellor, and the Speaker of the House of Commons. In the days of George II the activities of the State were but little developed, and to form a trust for the administration of a national institution seemed quite the natural course. Apparently the Exchequer was unable, or more likely unwilling, at this period to find the necessary funds, estimated at what must then have been regarded as the very large sum of £300,000, and the framers of the Act of Incorporation resorted to what would now be thought the strange expedient of a lottery. The amount raised in this way was less than was anticipated, but a remnant of it still appears in the Museum accounts, which contain an item towards expenses in the form of interest on the £30,000 originally set aside as a capital fund. This amount of £750 seems but a modest figure as a contribution towards the total of more than £200,000 (including the Natural History Museum) set out in the Parliamentary Estimates of 1919-1920.

Opening of the British Museum. In 1753, then, the nation had constituted its Museum, and soon after the Trustees bought Montagu House for £10,250 to serve as a home for it. But the Sloane collections, consisting of plants, minerals, fossils, the natural history collections of William Courten, printed books, MSS., prints, drawings, cameos, medals, and coins, had to be brought from Chelsea Manor House. The arrangement of these things and the other collections (including the Royal library of George II) was a work of time. Thus it was not until 15th January, 1759, that the Museum was opened. For many years the admission of visitors was allowed only under much restriction. In 1810 the regulations were relaxed, but it was not until 1879 that the public were admitted to the building (in Bloomsbury) every week day. Eleven years later the trustees went still further, and opened the galleries in the evening, but this was discontinued in 1897. Printed books, MSS., fossils, zoological specimens, are not, perhaps, what general visitors first think of when approaching the Museum. In their case the gods of Egypt and Assyria, the mummies, and, in a lesser degree, the Greek sculptures from the Parthenon come more easily to mind. It was not, however, until 1807 that the antiquities forming part of the original collections, and those

added subsequently, notably in 1772 and 1805, were formed into a separate department.

Graeco-Roman Collections. The latter year is mentioned because it and 1814 were marked by the acquisition of the Townley Graeco-Roman collections, including the majority of the finer single statues the Museum possesses, as well as bronzes, coins, gems, and drawings (the marbles cost £20,000; the smaller antiquities, £8,200). The Greek and Roman Department, as it is constituted to-day, is rich in Greek bronzes, terra-cottas, cameos, gems, and especially vases, including the Portland Vase of historic fame; but the "clou" of its examples of Greek art is to be found beyond question in the sculptures of the Parthenon. These celebrated works from the temple of Athene Parthenos were obtained by the seventh Lord Elgin while he was acting as Ambassador to Turkey at the beginning of the nineteenth century. They were brought to England in 1802 and, after prolonged discussion, the small aesthetic public of that period became convinced of their importance. But it was not until 1816 that an Act was passed by which the Museum acquired them for the sum of £35,000 as compared with £74,000, at which Lord Elgin estimated the expenditure he had incurred. The possession of these marbles did much to render London a European centre, and in these days the hesitation of Parliament in the matter seems surprising. But the long Napoleonic War had told on the public purse, and it should be remembered that, only a short time before, £19,000 had been expended on the marbles discovered in 1812 among the ruins of the temple of Apollo at Phigaleia. But for mischance, or misunderstanding, the Museum might also at this period have secured the Aeginetan sculptures now treasured in Munich. Ten years later, the department was enriched by the Payne Knight bequest (estimated at £60,000) of marbles, bronzes, and other antiquities. And now the process of excavation came to move the boundaries of Greek archaeology. The Lycian monuments, the Nereid Monument, the remains of the Mausoleum, the sculptured drum and other remains from the temple of Diana at Ephesus—all these noted works bear witness to the success of the explorations associated with the names of Fellows, Newton, Wood, and Hogarth. Closely related to the Greek and Roman antiquities are the classical coins comprised in the varied riches of the Department of Coins and Medals.

Egyptian Antiquities. The world of Egyptian antiquity lay long in obscurity. It is less dim now owing to the patient research of scholars, such as Champollion and Young. By right of the sword, the Rosetta stone passed to the British in 1801, since when many statues of the "brutish gods of Nile," and of Egyptian rulers and personages, have obtained for their resting-place in Bloomsbury a large and imposing gallery, which contains monuments covering a period of nearly 4,000 years from Memphis, Abydos, and especially from Thebes. Including sculptures, mummies, funerary records, devotional works (such as the Book of the Dead in various recensions), and smaller antiquities (such as scarabs and ushabti figures), the Egyptian antiquities comprise upwards of 57,000 objects. And in recent years the Egyptian soil has rendered up to excavation precious relics of the Ptolemaic and Roman periods such as the Aristotle, Herodas, and other papyri, now possessed and published by the Museum. The Assyrian branch of the collections

owes its being to excavation in the valleys of the Tigris and Euphrates. From 1845, systematic exploration has been carried on in the regions where once stood the temples and palaces of Nineveh and Babylon. Owing to the labours of Layard and Rawlinson, and their later successors (Rassam and Budge), a large province was added to the kingdom of archaeology. In the deciphering of the cuneiform inscriptions from the library of Ashur Banipal at Nineveh and elsewhere, the outworn, buried past of Western Asia has come to life again. In those menacing figures of the huge bulls of Sargon, the sieges and hunts of Assyrian friezes, and the records contained in about 120,000 tablets is supplied the material for reconstituting the energetic but cruel civilization of the Mesopotamian peoples.

Ethnographical Gallery. It was in 1861 that the Museum antiquities were divided into three departments. A fourth falls to be mentioned. In 1866, this was constituted of British and mediaeval antiquities and ethnographical specimens. The removal of the Christy collection to the Museum in 1883, and subsequent gifts by the trustees of that collection, have made the Museum rich in those ancient remains of man which form the subject of the modern science of prehistoric archaeology. A glance at the crowded cases of the Ethnographical Gallery shows what a long chapter they unfold for those that are interested in the customs and ideas of "savage" peoples. The Slade bequest of glass, and the Franks gifts of pottery and porcelain, and the acquisition of a portion of the Willett collection, were the principal constituents in forming the ceramic branch of the department. While the Henderson bequest contributed choice examples of ware from Spain, Rhodes, Damascus, and Persia, the Franks gift of specimens formerly exhibited at Bethnal Green and other gifts have made it richly representative of the potter's art of China and Japan. Limitations of space restrict one to merely a reference to such precious things as the "Cellini Cup," and the more famous one in gold acquired in 1892, and the artistic treasures, chiefly of the *cinqe cento*, bequeathed to the Museum by the Baron Ferdinand Rothschild.

Museum Library. As for the library of the Museum, the gifts of donors (royal and otherwise), the operation of the various Copyright Acts, and the purchase funds granted by Parliament have combined to make the national collection of printed books so comprehensive, that the workers in the varied fields of literature, history, politics, art, and science mostly find themselves urged at one time or another to seek the portals of the Reading Room. That the printed general catalogue to be found there now extends to more than a thousand folio volumes is eloquent of the labour and expense devoted to the formation of the library. Besides large collections of musical works, maps, charts, and topographical drawings, it possesses a unique collection of newspapers, which has overflowed the space at the command of the Trustees and necessitated an Act of Parliament (1902) for the transfer of part of them to a "repository" at Hendon. But these are primarily of journalistic or legal interest. The Museum caters also for the bibliographically inclined; and in the exhibition cases of the King's Library the observant visitor will con many prized examples of early typography, such as "block" books and early instances of printing from movable type as practised in the south of Germany, Rome, Venice, and other cities. In addition

to books, the library has possessed, since 1891, a valuable collection of postage-stamps bequeathed by Mr. T. K. Tapling. Persons seeking admission to the Reading Room (they should be of age) should apply, in accordance with regulations, by letter to the Director. The beginning of the Department of MSS. consisted in the amalgamation of the Cotton, Harley, and part of the Sloane collections under the original Act of Parliament. It has grown to its present size by aid of the moneys granted by the Government, assisted by the Egerton and Farnborough purchase funds, and by noteworthy gifts (such as the MSS. of George II and George III). The department contains upwards of 50,000 volumes, 76,000 charters and rolls, more than 1,900 Greek and Latin papyri, and a large number of detached seals. Such an enumeration gives but an imperfect idea of its historical, literary, and palaeographical riches, or of the interest for the student of art in the pictorial or decorative ornament contained in the "illuminated" MSS. One may point to the "Politeia" papyrus, the "codex Alexandrinus," the copy of Magna Charta, and the Sforza Book of Hours as outstanding treasures of the Department, but where these are so numerous it is difficult to select for special mention. At one time, the department contained Arabic, Sanskrit, and other Oriental MSS. But, in 1892, these were combined with Chinese and other printed books to form a separate Department of Oriental Printed Books and MSS. In early days, the prints and drawings were included in the Department of Printed Books. They now form a separate department, which, in 1913-1914, was transferred to the new wing in Montague Place. Purchases and gifts have made it one of the foremost art collections in the world. Besides its wealth of examples of the various European schools, the acquisitions in recent times of Japanese and Chinese prints (including Chinese paintings from the M. A. Stein collection) have been so numerous as to constitute a special sub-department of Oriental prints and drawings.

Structure of Museum. As to the Museum structure, it is of interest to note that Montagu House disappeared between 1823 and 1845, being replaced by the present building, designed in the Ionic style, by Sir Robert Smirke. The Reading Room was built (at a cost of £150,000) during the years 1854-1857. The White Bequest fell in 1879. From it was defrayed the expense of a new gallery for Greek sculpture and of the building on the south-east, opened in 1885. The foundation-stone of the new wing on the north, part of which was defrayed from the Stuckey Lean bequest, was laid in 1907, and the galleries opened by H.M. King George in May, 1914.

Admission to the Museum. Visitors are admitted daily except on Sundays, Good Friday, Christmas Day, and days of general fast or thanksgiving. Persons desiring to study in the Students' Rooms of the MSS. or other departments should apply in writing to the Director in accordance with the Trustees' regulations. The exhibits have been made instructive by the completeness of the system of labelling and the publication of cheap handbooks, and in recent years such facilities have been increased by the introduction of the service of official guide-lecturers.

The Natural History collections were removed to the Natural History Museum, Cromwell Road, South Kensington, during the years 1880-1883.

A. R. D.

BRITISH MUSEUM LIBRARY, THE.—(See LIBRARIES IN THE EIGHTEENTH CENTURY.)

BRITISH SCHOOL OF ARCHAEOLOGY IN ATHENS.—(See EXCAVATION AND EDUCATION.)

BRITISH SCHOOL OF ARCHAEOLOGY IN EGYPT.—(See EXCAVATION AND EDUCATION.)

BRITISH AND FOREIGN BIBLE SOCIETY, THE.—This Society was a result of the rapid growth of Sunday schools and the increasing need for Bibles. Its sole object was, and is, to "encourage the wider circulation of the Holy Scriptures, without note or comment." It was founded, in 1804, by the help of William W. G. Sharp and Thomas Macaulay, and under wide and distinguished patronage. Similar societies were formed in Prussia, Russia, and France, and missionaries carried the work into all quarters of the globe. In 1854, the Society had issued 28,000,000 copies of the Scriptures, and was aided by nearly 4,000 branches, which, in 1904, had increased to 7,875; while nearly 181,000,000 copies had then been issued. Bibles and Testaments are translated into the language of every country to which they are sent, and prices have been reduced so as to put the Bible within reach of the poorest.

BRITISH AND FOREIGN SCHOOL SOCIETY, THE.—This Society holds a prominent place among the pioneers of elementary education in England. In 1798, Joseph Lancaster had founded a school and training institution in the Borough Road, Southwark, when he developed his monitorial system. His work attracted the attention of George III, who granted him two interviews in 1805 and stated to him: "It is my wish that every poor child in my dominions should be taught to read the Bible." The king promised an annual donation of £100 in aid of Lancaster's work; and in January, 1808, a society was formed, entitled "The Society for Promoting the Royal British or Lancasterian System for the Education of the Poor."

The management of the institution at Borough Road was placed in the hands of an organizing committee under rules and regulations formulated in 1814, the Duke of Kent being then president of the committee. The rules remained in force till 1906, when Edward VII granted the society a charter of incorporation. The society has always had the patronage of the reigning monarch and of other members of the Royal Family, besides many highly placed members of the nobility. State aid was first received by the society in 1834, from which time till 1870 small sums were received from the Treasury and Committee of Council on Education. Since 1870 the connection between the society and the Education Department, and, later, the Board of Education, has been more intimate.

In the Royal Charter the principles of the society are thus stated—

"1. That the development of the physical, mental, and moral nature of children is an object worthy of pursuit for its own sake—privately as a philanthropic mission and publicly as a State concern.

"2. That this object is best pursued by combined action—all sects and parties sinking their differences in the provision of the best educational means, and using them in the common school on equal terms.

"3. That while the cultivating of religious thought, the expression of religious feeling, and the performance of religious work may, and generally do, lead up to creeds and separate churches, there are certain fundamentals of religion and morals which the intelligent reading of the Bible is the best means of encouraging."

The aim of the society, in accordance with these principles, has been pursued by—

1. The maintenance of institutions which illustrate these principles and prepare persons, who, as elementary school teachers, are able to put them in practice.

2. The encouragement of the foundation and maintenance of local, and ultimately independent, schools, at home and abroad; and providing them with books and materials from a central depository.

3. The administration of special funds for the award of scholarships and prizes.

4. The dissemination of literature, and otherwise.

Training Colleges. The training institution of Joseph Lancaster in the Borough Road (see **BOROUGH ROAD TRAINING COLLEGE**) was maintained there by the society till 1890, when a new site for the continuance of the same work was found at Isleworth, Middlesex. In pursuance of the policy of undenominationalism laid down in the Royal Charter of the society, the students are selected without reference to sect or party. This is well illustrated by the analysis of the denominations of students admitted in 1913: Episcopalian, 24; Congregationalists, 11; Wesleyans, 11; Baptists, 9; Methodists, 8; Unitarian, 1; Roman Catholic, 1.

Expansion of work led to the establishment of other colleges at Bangor (1858), Stockwell (1861), Darlington (1872), Swansea (1872), Saffron Walden (1884). These institutions have been enlarged from time to time, and in 1908 provided training for 652 students—equal to one-eighth of the whole number of resident students in the country. The Swansea College was transferred to the Swansea Education Authority in June, 1913. In all the colleges, an analysis of the religious denomination of the students shows figures similar to those quoted above.

Schools. Nearly 4,000 British schools were established by the society, but the largest number at work at any one time was about 1,500. After 1870, many of these schools became board schools, and others were closed to be replaced by publicly-controlled schools. Since the passing of the Education Act of 1902, other British schools have been either closed or transferred to local authorities; and the 600 or so which remain are no longer known as "British," but as "non-provided" schools.

The schools remaining under the direct management of the society longest were the Sturge British School at Northfleet, Kent, and the Russell British School at Petersham, Surrey. But schools have been built for the practical work of training college students at Stockwell, Darlington, and Saffron Walden. The schools at Sturge and Petersham were handed over to the society to be maintained in memory of benefactors. The Corby British School (Northamptonshire) was also maintained until, in 1906, by order of the Charity Commissioners, the endowment was devoted to exhibitions, bursaries, and the provision of schools for cookery, etc.

The society publishes an annual report of its work, giving much detailed information concerning its colleges and schools. The present organ of the society is *The Educational Record*, which is published four times during the year.

The London offices of the British and Foreign School Society are at 114 to 116 Temple Chambers, Temple Avenue, E.C.

BROTHERS OF THE COMMON LIFE.—(See **BRETHREN OF THE COMMON LIFE**; **ROMAN CATHOLIC CHURCH**, **THE TEACHING ORDERS OF THE**.)

BROUGHAM, LORD (1778–1868).—Was born and educated in Edinburgh. His early ability secured him admission to the Royal Society at the age of 18, and at 24 he contributed articles to the *Edinburgh Review*. In 1808 he was called to the Bar in England, and two years later he entered Parliament. For many years he was one of the most popular Parliamentary figures, and in 1822 brought forward a scheme for national education. This was not successful, but he was largely instrumental in securing the foundation of the London University, (*q.v.*), the first Mechanics' Institute (see **BIRKBECK**), and the Society for the Diffusion of Useful Knowledge (*q.v.*). He strongly supported the abolition of slavery, and his powerful speeches on that subject and on Reform made him the Reform leader in debate. In 1830 he accepted a peerage and the Lord Chancellorship, and practically carried the Reform Bill through the House of Lords. His arrogance and the peculiarities of his character rendered him unpopular with his colleagues, and after the Whig Government went out in 1834 he never held office again. The remainder of his life was spent chiefly at Cannes. Brougham repeatedly pressed on Parliament the need of a system of national education, but the lukewarmness of some and the scruples of others defeated all his plans. He argued that leisure hours of the working classes ought to be beneficially employed, and that reading should be one of their recreations. Their difficulties were want of time and want of money: books were dear, instructors were few, and men had not the time or the means to educate themselves. Brougham divided popular education into three branches: (1) Infant schools; (2) elementary schools; (3) adult schools, such as Birkbeck's Mechanics' Institute. He believed that any Governmental interference with the first would be inexpedient, and with the third, perilous to civil and religious liberty. But attention should be paid to elementary schools. Cheap publications and elementary text-books should be encouraged, and for that purpose the tax on paper should be removed. Book clubs and reading societies should be established; the rich could help the poor; parish, cottage, and itinerant libraries would help the work. Lectures, combined with reading and elementary books, would promote learning. Brougham considered that the expenses ought to be defrayed mainly by those benefiting. He believed that the stability of the nation would be secured by the diffusion of knowledge; but "no such scheme can either take root or spread over the country so as to produce its full measure of good unless its support is derived from those who are chiefly to reap the benefits." Brougham established infant schools where the children of the poor might become familiar with cleanliness and truth, and, being treated with kindness, they might enjoy a measure of happiness not to be found in their own homes. He held that the first step in education should be to elevate the views and refine the character of the masses. He appealed to the rich to aid his schemes, especially to those who were already squandering large sums

of money under mistaken benevolence. Many charitable funds had little result but to promote idleness, poverty, and improvidence. Brougham would have diverted such funds to the more real and useful charity of providing education for the poor.

BROWN, JOHN (1720–1787). — An eminent Scottish divine, born in Perthshire. Without instruction from any master, he learnt Latin, Greek, Hebrew, and several modern European languages, as well as Arabic and Persian. He joined the Secession Church, becoming a licensed preacher at Haddington; and, in 1768, was appointed Professor of Divinity. His chief works are a *Dictionary of the Bible* and the *Self-interpreting Bible*, which is still very popular in Scotland.

BROWN UNIVERSITY, U.S.A.—(See UNITED STATES, COLLEGES AND UNIVERSITIES OF THE)

BROWNIES.—(See GIRL GUIDES.)

BRUNI (or ARETINE), LEONARDO. — An eminent scholar and historian who derived his name from Arezzo, the city in which he was born in 1370. He is said to have acquired a love of letters from a daily contemplation of the portrait of Petrarch during a period of captivity. He became one of the most learned men of his age, and learned Spaniards and Frenchmen travelled to Florence to see him. He held public offices in Florence, and was a trusted servant of the Popes John XXII and John XXIII. He wrote a history of Florence, histories of Italian and Punic Wars; and also edited many Latin and Greek classics, including seven of Plutarch's Lives and ten books of Aristotle's Ethics. His works were greatly esteemed during the fifteenth and sixteenth centuries.

BRUSSELS, THE UNIVERSITY OF.—(See BELGIUM, THE UNIVERSITIES OF.)

BRYCE COMMISSION, THE.—Secondary education, after the Act of 1891, came into public thought and discussion. The growth of evening schools and the influence generally of the Technical Instruction Acts (see CROSS COMMISSION, THE) were symptomatic; and a Royal Commission, with Mr. J. Bryce, M.P., as chairman, was appointed in March, 1894. Among other members were Sir J. T. Hibbert, M.P.; Professor Jebb, M.P.; Lady Frederick Cavendish; the Dean of Manchester; Sir H. Roscoe, M.P.; and Mrs. Henry Sidgwick. Their Report was issued in October, 1895, and does not go far in the direction of an organic system in which all forms of education should find a function. The parish is still the unit for elementary, though the county is the unit for secondary education. The terms of reference to the Commission also imply that secondary education is a thing apart from elementary; and in that respect, at least, the Act of 1902 is in advance of current thought in 1894 and 1895. The chief recommendations of the Report dealt with administration—

1. Separate bodies of existing control should be brought under a single Board and in a single office: the Charity Commission—so far as dealing with matters educational—the Department of Science and Art, and the Education Department becoming unified as a Board of Education. There should also be a Consultative Committee to advise the Board upon educational questions.

2. Local authorities should be established, to consist of committees of county councils with co-optative members.

3. (a) A register of teachers should be established, as well as (b) a system of school inspection and examination.

A reasonably early outcome of the labours of the Commission was the Board of Education Act, 1899. By this Act, the post of Vice-President of the Council was abolished; but the post of President of the new Board was created, and—by implication—the post of Parliamentary Secretary, while other recommendations under (1) and (3) above were duly carried out. The remaining recommendations waited for the Act of 1902, and were in that Act not only incorporated as suggested by the Commissioners, but materially extended and developed so as to secure the potential co-ordination of the various types and grades of schools under the control of the same local authority. A. E. L.

BUCHANAN, GEORGE (1506–1582).—Was born in Stirlingshire, and at first brought up in great poverty by his widowed mother. After a short period of education in Paris, he entered the University of St. Andrews, where he took his degree in 1525. For a few years he taught in French colleges, but in 1538 returned to Scotland, and, having adopted Lutheran opinions, wrote against the vices of monastic life as he had seen it. His satires aroused the anger of Cardinal Beaton, and he was obliged to seek safety in England, and afterwards a livelihood in France. There he composed dramas in Latin, full of noble sentiments, and dealing with honour, liberty, and patriotism. In Bordeaux he was Professor of Latin at the College of Guienne, and in Paris he taught in the college of Cardinal le Moine. In 1547 he joined Coimbra University, but fell a victim to religious persecution and was imprisoned. In 1560 he returned to Scotland, and became classical tutor to Mary Queen of Scots, whose marriage he celebrated in a beautiful poem, *Epithalamium*. In 1571 he became a tutor to the young King James. Buchanan was held in high esteem by the rulers of Scotland; and, being appointed director of the chancery and also privy seal, he wrote *De Jure Regni apud Scotos*, a defence of popular government, arguing that liberty depended not on the king's pleasure, but on law. Buchanan ranks as the greatest of Scottish Latin scholars. His Latin works show a perfect knowledge of the language, and have been considered by critics to rank with those of Tacitus and Livy. While imprisoned in Portugal, he began a Latin version of the Psalms in every variety of metre: his 104th and 137th Psalms have always been much admired and quoted for their magnificent imagery and musical cadences. Although a scholar and a poet, he made patriotism and statesmanship the aim of his life. His satirical poems did much to further the work of the Scottish Reformers, and the Earl of Moray appointed him Moderator when the ecclesiastical court met in 1567. He was also a member of various assemblies of the Scottish Church, and one of a commission appointed to revise the Book of Discipline. Buchanan was buried in Greyfriars' Churchyard, Edinburgh.

BUCHANAN, JAMES.—Described by Robert Owen as a poor, simple-minded, kind-hearted weaver, with a strong natural love for children, and

scarcely able to read, write, or spell, who became the first master in a rational infant school. Robert Owen had succeeded, after years spent in overcoming obstacles, in establishing an infants' school in New Lanark, and in 1815 selected Buchanan as the first teacher. In 1818, Buchanan went to London at the request of Lord Brougham, who had visited New Lanark and seen the work there. The new school was established in Westminster, and Buchanan had charge of it for at least seven years.

Wilderspin, another early teacher of infants, made Buchanan's acquaintance while the latter was at Westminster, and, as a result, took the management of a similar institution under the same committee. Wilderspin learnt much from Buchanan, and has left some descriptive details of the work done in New Lanark. He says that: "Instead of wandering about the streets, these children are taken care of and made happy; amusement and exercise for them are not forgotten, and they are frequently seen dancing to the sound of a flute."

Buchanan appears to have left England about 1840 and to have gone to South Africa as an infant teacher.

BUCHAREST, THE UNIVERSITY OF.—Founded in 1864, the University of Bucharest contained in the years before the war, upwards of 3,000 students in the faculties of theology, law, literature, science, philosophy, and medicine and pharmacy. Nearly half of these were students of law, and there were over 200 women on the rolls. Bucharest is a free university—no fees are charged. The buildings are an example of the best modern Rumanian architecture, and include the great national library, which contains a number of valuable Oriental manuscripts, and the house of assembly of the Rumanian Senate. There are at Bucharest also a school of veterinary science, the national schools of architecture and art, and two seminaries for the training of clerical schoolmasters.

BUDA-PEST UNIVERSITY.—This was founded at Ofen, 1390; removed to Pest, 1783; and placed among Austrian universities, 1850. It has the usual four faculties, and is aided by a Government subsidy. There is a library of nearly 300,000 volumes. Connected with the University are a technological school, theological academies, an academy of science, and a geological institute. The number of students is normally about 7,000.

BUDDHA AND BUDDHISM.—The founder of Buddhism was Siddhartha, son of a king of Northern India in the fifth century B.C. His contemplative disposition caused him to lead an ascetic life in order to think out the causes of things and the philosophy of existence. Having obtained the perfect wisdom of the Buddha, or the "Enlightened," under Bodhidruma, the tree of Intelligence, he taught in North India. He died in Oudh, and relics of his body were distributed among his disciples.

Buddhism prevailed widely in India until driven out by the Mohammedan invasions; at present, it is limited to Nepal and Ceylon. It is, however, the chief religion in Further India, and of vast numbers in Thibet, China, Japan, Mongolia, and Southern Siberia. The doctrine is based on transmigration: birth is only a change of existence, there is no God, and a man's actions alone determine his future form in future existences. A meritorious life

secures a higher life on earth, or as a spirit, or in a heaven for millions of years. An evil life is punished by a degraded existence, or by millions of years in one of the 136 Buddhist hells. Buddhism assumes that human life is essentially miserable, possibly because the race to which Buddha belonged knew so little of earthly comfort and happiness. Death is welcomed as a gateway to a possibly happier existence, hence the little value set upon life and the contempt of death among Buddhist nations. The aim of Buddhism in life is to escape being born again, to cease to exist, to enter a state of utter unconsciousness called Nirvana—the way to which is a pathway of virtue—and the teachers enjoin a life of virtue to this end. The moral precepts of Buddhism are similar to those of Christianity, and include many commands laid down in the Mosaic Law and in the Sermon on the Mount. Self-denial, patience, humility, and abstinence are necessary virtues, and hence large numbers of Buddhists lead ascetic lives. Around Lhasa, one third live in monasteries and subsist on charity. Benevolence, purity, truth, courage, and contemplation are enjoined, and the moral code has been described as second only to that of Christ. There are no priests or regular clergy, and the religious observances are limited to the public reading of the Scriptures by the monks and the adoration of Buddha's statues and relics, with offerings of flowers, fruits, and incense, and the singing of hymns.

BUDÉ (BUDAEUS), GUILLAUME (1467–1540), was he through whose efforts the Collège de France provided a centre at Paris for the Renaissance spirit as the establishment of the College of the Three Languages by Busleiden, under the direction of Erasmus, had done at Louvain; and the similar College of the Three Languages had done at Alcalá; and as Bishop Fox's College of Corpus Christi had done at Oxford. Budé, at the head of the French classical scholars of his day, took a leader's part in the movement which brought pre-eminence in classical scholarship, in the sixteenth century, away from Italy. William was the son of John Budé, a rich man, who possessed a fine collection of rare books, and had his child taught by private tutors until he went to Orleans to study law. He made little progress in these years, and then gave up studies and lived the life of a nobleman, taking special interest in his horses. At 24 years of age, he was converted from frivolity to serious studies, and, without masters, taught himself Greek, and browsed widely among Latin authors. He would not pass on without clearing up each difficulty as it came. Budé gives an account of his studies in a letter to the English Cuthbert Tunstall. He then secured help in studies from the Greek Lascaris and the mathematician Jacques Lefèvre, and added studies in the fine arts, natural science, philosophy, history, medicine, and again took up the study of law. In 1503 he married Roberte Le Lyeur, who helped him in his studies. Stories are told showing that scholarship was a passion, to which all things else were secondary. He regarded it as a great sacrifice that he contented himself with three hours' study on his wedding day. One instance of Budé's abstraction has often been quoted, viz., the communication to him by the maid, one day in his study, that the house was on fire. "Go and tell my wife," said Budé, without taking his eyes off his book; "you know very well

that I don't engage in the household affairs." In 1514, he published *De Asse et partibus ejus*, a research into the Roman coinage, but so treated as to bring out a great knowledge of general, social and economic history. Budé seems to have done his hardest work when his health was weakest.

Budé as a Greek Scholar. His great reputation as a Greek scholar was won specially by his *Commentarii Linguae Graecae* (1529), a collection of vast material of research, which combined the work which, in later ages, was differentiated into dictionaries, works of criticism, and text-books of syntax. Much was transferred by Stephens to his *Thesaurus*.

Hallam describes Budé as the most profound Greek scholar in Europe of the time, and says that these Commentaries of Budé "stand not only far above anything else in Greek literature before the middle of the sixteenth century, but are alone in their class."

In 1534, Budé published *De Transitu Hellenismi ad Christianismum*, in which Greek studies themselves are regarded as secondary and preparatory to the true understanding of Christianity.

Importance in Education. Budé is, in the history of education, of direct importance in his treatises: *De l'Institution du Prince* (1516) and in his *De Studio Literarum recte et commodè Instituendo* (1527). Consistently with his own scholarly aims, he regards Greek as the most important of all studies for the prince. It is the basis of all liberal learning, and therefore necessary for a king. Eloquence is necessary for every ruler or leader as the interpreter of knowledge in its application to life. His greatest contribution to the educational problems of his time, after his insistence on Greek, is his enthusiasm for the study of history. Scholars should be set aside for research in history, and bring history above the level of Court annalists. He praises princes of past time for their liberality to historians, to *savants*, and to *littérateurs*; and indirectly pleads, like Francis Bacon pleaded later, directly, for kings to assist financially the "advancement of learning." The outcome of Budé's persistent advocacy of the claims of scholarship to the king (Francis I) may be said to be the foundation of the Corporation of the Royal Readers in 1530, which developed afterwards into the Collège de France. Francis I had long recognized the high value of Budé, and in 1522 had chosen him as Royal Librarian.

Budé, unlike so many of the Renaissance scholars, did not deprecate the vernacular. The *Institution* (written in French), though not published till 1546, was compared with *La Defense et Illustration de la langue françoise* of Joachim du Bellay, which, in spite of its limitations, is essentially the justification of the use of the vernacular, and was not published till 1549. Budé, therefore, ranks as a pioneer in the writing of the French language by scholars.

The current estimate of scholarship of Budé's time considered that the leadership was centred in a triumvirate: Erasmus (*q.v.*), Budé, and Vives (*q.v.*). Though the relations between Erasmus and Budé were sometimes strained, we may accept Vives' view that, in the main questions of humanistic culture, Erasmus and Budé had "one mind in two bodies." (On this point, see *Le Musée belge "Une Amitié d'Humanistes. Étude sur les relations de Budé et d'Erasmus d'après leur correspondance, 1516-1531,"* by L. Delaruelle: pp. 322-351: 15 Oct., 1905.) F. W.

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BUFFON, COMTE DE (1707-1788).—Was educated in law, but devoted himself to science. After a visit to England, he translated into French Newton's *Fluxions* and Hales's *Vegetable Statics*, and, gaining distinction by his scientific works, he became a member of the French Academy. In 1739 he was appointed director of the Jardin du Roi, and devoted his attention to natural history. His *Histoire Naturelle* appeared between 1739 and 1767, and secured for him a great reputation, more on account of his pompous style than of his scientific accuracy. The chief interest now remaining in his work is that it contains suggestions of the theory of evolution.

BUILDERS, THE INSTITUTE OF.—The Builders' Society was founded in 1834, and its assets and liabilities were taken over by the Institute of Builders, which was incorporated in 1884. The membership of the Institute consists of men of distinction in the building world, and each one must be nominated and seconded by members and elected by the committee.

The objects of the society are to promote the consideration and discussion of questions affecting the building trade, and to protect and promote the interests of persons in it. It aims also at giving to the Legislature and public bodies, facilities for conferring with persons engaged in the building trade on pertinent matters.

It provides for the giving of lectures and the holding of classes for the improvement and general knowledge of persons engaged in, or preparing to engage in, the building trade; and for holding examinations and awarding certificates, scholarships, and other rewards.

The Institute interests itself in the proper conduct of business in the building trade, forms of contract, and the settlement of disputes by arbitration. It also takes steps to encourage discovery and investigation, and to make known the nature and merits of inventions which might be useful to builders, architects, and others. The membership consists of associates and honorary members.

The office of the Institute is at Koh-I-Noor House, Kingsway, London, W.C.2.

BUILDINGS, SCHOOL.—We, naturally, are proud of the part that our country has played in shaping this world's evolution, but of nothing in things physical should we be more proud than of the lead our country has taken in sanitation and hygiene generally. The people of this country saw that the health of the people was a practical



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PLATE XV

question, and when history comes to be written in days that are not yet, when things of our time will be seen in their right perspective, not least of which our children will be proud will be the important part we have played in looking after and improving the health of the people. Not a country in the world but has felt the influence of our school of hygienists, whether in the value of fresh air, of plumbing, of drainage, or the many other phases of the subject. In our buildings, such as hospitals, the influence was, of course, the more pronounced, and in many other buildings reforms have been effected. Nevertheless there is still much to be accomplished, and it must be a matter of surprise that schools received so little attention prior to this century. It seems strange now to think how schools were multiplied, how the tendency grew to make schools more compact, how intense was the desire that the school should be so arranged that the head teacher had as little walking as possible to do; how, in short, everything was considered except how best the buildings could be made to minister to the bodily health of the teachers and children. When schools first began to be erected in this country in any number, there was no attempt at compactness. They were generally simple buildings either oblong or shaped like the letters T or L. Nearly all the walls were outside walls, and thus allowed a certain amount of "breathing" to take place. When alterations are called for, these buildings present no difficulty worth mentioning to the architect wishing to bring them somewhere near the standard to which we have now attained, the worst feature often being the fact that the windows are small and do not open. As education became more appreciated and the numbers attending increased, it became necessary to add to the buildings. Where this happened on sites that were restricted, compactness was, as might be expected, paramount. Evolution in school planning proceeded, but compactness ruled the day, and gradually was evolved the *Central Hall* type of school, one of the most compact types of building ever devised, in which all the classrooms opened out of the central hall, and where the head teacher, perched on a dais in that hall, could see every class at work. But at what cost! Hygiene was almost left out of account if we except the craze for glazed brick dados. All that is altering, and in what manner this article will endeavour to show, but it by no means follows that what is good to-day will remain good to-morrow. The State was a long time making up its mind before admitting the school doctor—the one man who more than anybody should know what is right and be able to offer sound advice. Although this country has been the pioneer in matters of hygiene, and although many of our schools since 1870 have been public buildings erected out of public funds, it was not till 1907 that an Act was passed which put the medical side of the case on a sound footing. The Act of 1870 made no provision whatever, and while there was every excuse for this so early in the day, it is strange that the Act of 1902 (which has done so much for the education of this country) also left out the medical and hygienic side. Even with the Act of 1902, the most that could be done for the children by the school medical officer was to diagnose cases, the treatment being left to others. Nevertheless, the Act of 1902 made many things possible. Large education authorities, being brought into existence, it was to be expected that their

medical officers would make their influence felt. The credit for the first step is with the county of Staffordshire, and its Medical Officer of Health (Dr. George Reid), who, in no measured terms, condemned the central hall type of school as equivalent, more or less, to "back-to-back" dwellings. A neighbouring county quickly took up the chase, and since that time there has been a friendly rivalry throughout the country between many of the progressive authorities and their architects as to which could provide the most efficient and healthy school at a reasonable cost. The good work has begun, is still going on, and many a teacher lives to bless the day that made it possible for him or her to live and teach children amid healthy surroundings. The health of all is better, the teachers feel less fatigue, and the high percentage of attendance with its consequent grant justifies the case from a business point of view. Since between 1914 and 1918 so many of our strongest and best laid down their lives for their God and country, it behoves us to see that the rising generation is reared amid healthy surroundings and sent forth into the world under the best possible physical conditions.

Ventilation. It is proposed to deal in a concise manner with the various kinds of school buildings and the special apartments to be found in each, but before doing so it will be necessary to consider and understand thoroughly the problems of ventilation, of lighting, and of heating. Those three factors must be considered and provided whatever the educational establishment, and all the various rooms will be found to arrange and adapt themselves in relation thereto. They are of primary importance especially in classrooms, and it is, therefore, with the classroom more particularly in mind that the notes on these three matters are written. Of the three, ventilation is undoubtedly the most important. Poor lighting and indifferent heating can be tolerated longer than bad ventilation, though, of course, all are undesirable. To begin with, we must unlearn two things and start with an unprejudiced mind. The two things to unlearn are (1) that the primary need for ventilation is to supply fresh oxygen to the lungs owing to the oxygen of the expired air being greatly reduced; and (2) that the best ventilation is obtained by admitting air at the bottom of the room and taking it out at the top. Both of these are legacies from a past generation of medical men and scientists. Having taken the negative side of the case, we must now state the positive, which is that (a) the primary need for ventilation is to promote skin activity; and (b) that the simplest and best ventilation is obtained by causing the air to pass through and across a room with the least inconvenience to the occupants. Until quite recently, it was assumed by scientists that every human being ought to have 3,000 cub. ft. of air per hour, on the assumption that the amount of oxygen in the expired air was considerably reduced and that such air contained an injurious excess of carbonic acid gas; and, further, that air from the lungs added to the ordinary air a poison. There seems little to support these theories. In the case of reduced oxygen, it has to be remembered that consumptives are treated on mountains, while in the case of carbonic acid gas it has been satisfactorily shown that any excess in the air around us cannot enter the body. We are wonderfully constituted, and there is an arrangement which keeps the carbon-dioxide in its place; and the only result, it would appear, from breathing

so large an amount as '5 per cent. is a slight increase in the ventilation of the lungs. The existence of a supposed poison in the expired air has been the subject of investigation, and from its results there appears to be nothing, or next to nothing, to substantiate the statement that expired air contains a poison. If, therefore, the chemical side of the case shows little or no need for ventilation, it will be asked, quite reasonably, what are the grounds which justify it, and the key to the answer will perhaps be found in the reason for people expressing themselves as being unable to breathe on still warm days when the air is charged with moisture. The warmth, excess of water vapour, and lack of air movement bring about "a heat stagnation of the body and monotonous conditions of cutaneous excitation"; and the same symptoms experienced outside are also experienced inside a building, provided the conditions of the air inside the building are similar. People concluded it was because the air was "bad," but experiments have shown that other reasons must be sought. In an experiment carried out in a chamber of 3 cubic metres, in which a man was enclosed for four and three-quarter hours, the conditions became almost unbearable. Those without were able by means of tubes to breathe the air from inside the chamber without discomfort. In another experiment, the man within, although breathing pure air from outside, experienced pronounced feelings of discomfort, but these symptoms disappeared when the temperature was considerably reduced. On another occasion, students enclosed in a chamber experienced great relief when electric fans were turned on, although they were still breathing the same air. Experiments such as these show that the *cause* of discomfort in crowded rooms is heat stagnation, and lack of skin activity the body being unable to get rid of its waste products; and that the *cure* for these ills is cooling the air and cooling the body by keeping the air in motion. The experiments quoted above are from a remarkable report by Professor Leonard Hill, a report which should be read and mastered by every teacher and all interested in school hygiene. [*Report on Ventilation, and the Effect of Open Air and Wind on the Respiratory Metabolism.*] The following extract will not be out of place: "Over-heated rooms and still air decrease the activity of the body furnace and so lead to lessened vigour and resistance to disease. Particularly is this the case if over-eating accompanies over-heating—for the food eaten is not required to keep the body warm, and undergoes bacterial decomposition in the bowel with the consequent deterioration of health. The over-heated air of rooms with the rapid changes of temperature from this air to the outside winter air leads to the disturbed function of the respiratory mucous membrane, with the consequent acquisition of colds and respiratory infections. It is not the cold outside air which causes the trouble, but the over-heated atmosphere of the room. The general belief that exposure to cold is the cause of all trouble is greatly to be deprecated. So far as real evidence goes, those who expose themselves freely to the open air and cold weather become hardy and vigorous, and do not take 'cold.' Excessive protection from cold weather by over-clothing, over-heating, and shutting out of wind lessens immunity and increases the susceptibility to such diseases as pneumonia and phthisis. The evidence of this research is in favour

of open air schools, open workshops, garden cities, and means of affording sedentary workers opportunities of open air exercise to counteract the effect of their employment in still, warm atmospheres. When it is generally realized that it is the physical and not the chemical conditions of confined atmospheres which influence health and happiness, a vast improvement in the condition of home and industrial life will be effected."

Lack of ventilation not only lowers the tone and renders people less immune to infection and disease, but it also provides the conditions under which bacteria becomes most harmful and allows them to attack individuals in "mass formation." In classrooms where children are taught in large numbers, the need for ventilation, one would think, could not fail to be seen, and yet there are many teachers who seize any excuse for keeping windows closed. The fact that their numbers are decreasing year by year buoys one up to look for the day when closed windows in schools shall be regarded as almost a criminal offence.

If further evidence of the need for ventilation be necessary, it may be found in the fact that, where no school baths are provided, some children after infancy rarely have a bath from head to foot. What is even worse, some teachers fail to realize that the

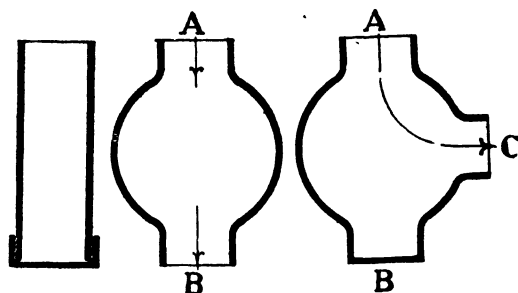


FIG. 1.

FIG. 2.

FIG. 3.

offensive smell in a stuffy school is not due to perspiration, but to the fact that children are not provided with, and therefore do not use, sanitary paper. This, coupled with the fact that clothes are sometimes, by means of cutting down, made to serve for two or three persons and children, should, one would think, make everyone in school emphatic on having pure air admitted as much as possible.

Having seen the need for ventilation, the next question, and perhaps a more controversial one, concerns the best method of admitting air so that it may be constantly in motion and changing. We shall best understand the case, perhaps, if we regard air more or less as a liquid, and argue from some of the *data* of liquids. Let us take a tube with one end closed (Fig. 1). This tube will hold just so much and no more, neither can anything pass through it unless the solid bottom be removed. If this be done, there is no limit to the amount that will pass through provided the supply be kept up. Now let us assume that instead of the tube being straight, it is made to bulge out between the two extremities (Fig. 2). Practically the same amount will pass through as before, assuming that the inlet A and outlet B are the same size as before, and that the same supply is kept up. Now let us assume that the bottom is solid again, and that an outlet C is made in the side (Fig. 3). The flow will

then short circuit and very little movement will be observed in the liquid below the current from A to C, while the movement between A and C will be very marked. If we turn our figures, making A face towards the left and replace liquid flow by wind pressure, we can get some idea of the action that takes place in a room. There must be in every apartment an inlet and an outlet if air is to be kept in motion and changed. If windows be placed on

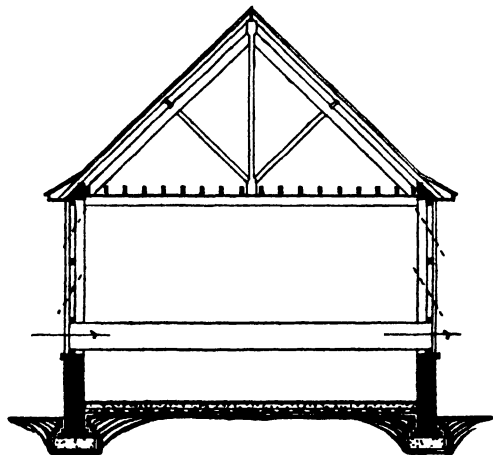


FIG. 4.

opposite sides of a room and a tube be made to connect them, the amount of air passing through that tube will depend upon the wind pressure at one end. If at the other end the windows be shut, no change or movement can take place, provided the pressure at the one end be constant and uniform. Now let us take away the tube, and then the walls, floors, and ceilings will to all intents and purposes give us the bulge in Fig. 2. If the windows on both sides be open, the air will pass as in the tube, but will spread and diffuse throughout the room before passing out on the side opposite to that on which the wind pressure is exerted. If we close the window on one side and provide an aperture in the ceiling, we shall find, provided complications do not intervene, that the air passes in at the window and short circuits through the aperture in the ceiling, leaving the air in the greater part of the room with little if any movement and change. (Figs. 4, 5, 6.) It used to be assumed that, as used air became warmed during expiration and from other causes, it was only right and proper that cold air being heavier should be introduced at the bottom, leaving the warm air to escape as best it could through the ceiling. This theory took account only of the difference in weight between cold and warm air, and regarded this as practically the only thing to consider in producing ventilation. It quite overlooked the fact that in a room with windows on one side only and on days with no wind, or days with the pressure not on that side and with little difference between the temperatures of the inside and outside of the building, that the cold air would of its own weight pass down through the roof extract, causing an inconvenient draught quite subversive of the theories put forward by those interested in roof extracts. Only too many teachers in our older buildings are aware of this fact. The promoters of the upward theory also quite failed

to take account of the fact that wind in motion was quite capable of upsetting, and actually did quite easily upset, the difference between the two columns of air. As air movements are invisible and can only be judged indirectly, it may be asked how these statements can be proved. And the answer is—smoke! It is quite simple, and the experiments can be carried out by anybody. All that is necessary is a piece of brown paper that will smoulder well. The direction that the smoke takes can be easily followed, and the direction of the air currents thus observed. The writer uses smoke rockets 6 ins. long, such as are used for testing drains, etc. It is sometimes asked whether the heat from the smouldering paper does not cause the smoke to rise; but if the rocket be held outside the window and the wind allowed to play on the smoke, much of the heat is lost before entering. This test does not show the speed with which the air is changed. Judged by an anemometer, it may be found that the air in a room is being changed every six minutes, while the smoke from a 6-in. rocket may take twelve or fifteen minutes to get clear away. The smoke test is useful only for showing the direction of the air currents.

It is hoped that enough has been written to show that the best way of ventilating a room is by means of Nature's ventilator, namely, the wind, and that the best way of getting Nature's ventilator to work is by means of open windows on opposite sides of a room. What may be inlets one day may be outlets the next, depending, of course, upon the direction of the wind. It may be asked what happens if the wind be on the end of a building and not on one side. Of course, a wind dead-end-on would not be of frequent occurrence. Even if it were, the wind would be constantly moving slightly from side

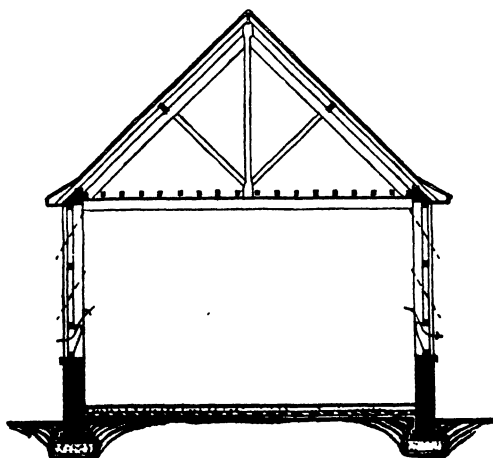


FIG. 5.

to side, and this would be sufficient to produce air movements along the sides of the building first on one side and then on the other, but with this difference: that whereas with the wind pressure on the side the air is forced through, the wind pressure when end-on tends to create a vacuum and the air is then sucked out rather than forced out.

We have now seen the necessity for ventilation, and that the best and simplest means is that provided by Nature—namely the wind. But wind left to itself can prove very disagreeable inside a building,

and it therefore becomes necessary to see that the air is introduced in such a manner as not to become a nuisance to the occupants. In all ages, one of the chief features in a building has been its windows, and there is reason to think that the present age may leave a mark by reason of the use of a particular kind of window known as the hopper. When properly constructed, it is the best means that can be found of introducing air, but so many people fall short at the critical point in its construction. A hopper is a casement which is hinged at the bottom and falls inward, thus compelling the incoming air to be deflected upwards and diffused so as to avoid a draught. Fig. 7 shows the kind of window that is meant. The distance from A to B should be much in excess of the opening at C, so that the air may be concentrated and add to the impulsion of the air upward. By experience, the writer finds that the opening at C should not be more than 4 ins., and that the depth A to B should

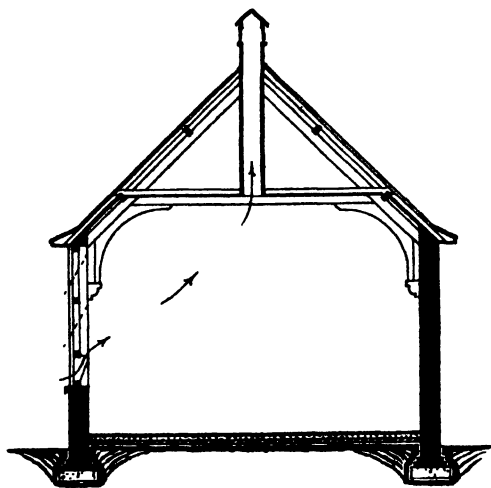


FIG. 6.

be about 18 ins. This gives a good angle of inclination for the hopper. If hoppers be made to open 8 or even 10 ins., as they are sometimes made to do, the sharpness of the upward current is reduced, and the air comes in in "lumps" as it were, falling on the heads of teachers and children before being properly warmed, and thus producing uncomfortable results. But the most common error is the failure to understand that hoppers are intended to admit air in an upward direction. As the hopper falls open, the vertical distance from E to F is gradually reduced, and the point E gets further and further below the bottom edge of the window frame at G. There is then left an unprotected vertical distance between E and G, which allows the air to enter horizontally as indicated by the arrow in the drawing, thus entirely missing the point for which hoppers were invented. It has been a matter of great surprise to the writer to find how many people have failed to grasp this point in construction. All that is needed in the case of wooden hoppers is to have a fillet (a narrow strip of wood) for the hopper to open against, and in the case of iron hoppers, a glazed screen 3 or 4 ins. high (as shown in the accompanying sketch). Where iron hoppers of wrong construction have been put in,

the matter can sometimes be helped by inserting in the window frame a piece of glass on the outside of the window, thus forming an outside screen in lieu of an inside one. Too much attention cannot be paid to the points mentioned above, as they make all the difference between efficiency and its opposite, and there is no reason why a thing should be wrong when it

can just as easily be right. Where hoppers are properly constructed, the writer had proved by many experiments that, given 10 sq. ins. per child of opening at the top of the hopper to act as inlet, and a similar area on the other side of the room, and given also a breeze of 4 miles per hour normal to one face of the building, the air is changed in classrooms ten times per hour without discomfort by means of the hoppers only, and without the use of other windows. This is sufficient to keep the rooms quite fresh while in use. During playtime and on hot days it is desirable that the rooms should be thoroughly air flushed, and for this purpose all windows should be made to open. The most satisfactory form would appear to be what is known as centre-hung casements. These, when opened, deflect the air upward, and all currents enter the room more or less in a similar direction. Sometimes sliding sashes are used, with a sloping fixed screen on the inside to act as hopper. The bottom sash is lifted to admit the air through the hopper part; and to admit of air flushing, the top part is pulled down. This often produces contrary currents, and half of the window at least is obstructed by the area of the sashes, which must remain in position. After experience with both kinds of window, it is claimed that the centre-hung lights

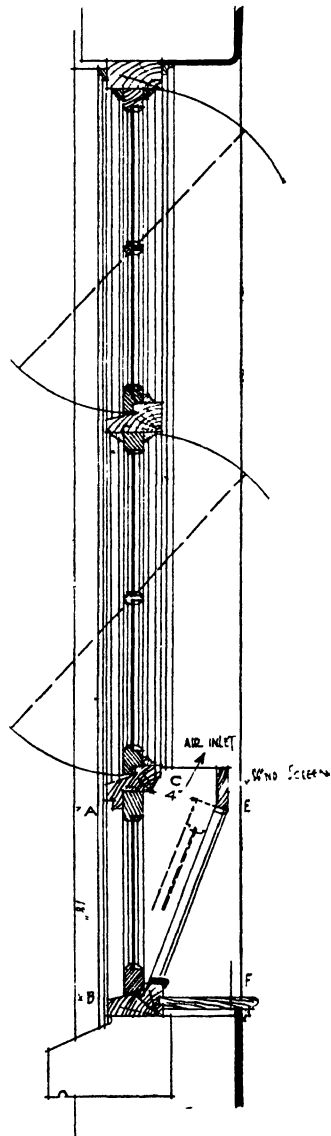


FIG. 7.

used, with a sloping fixed screen on the inside to act as hopper. The bottom sash is lifted to admit the air through the hopper part; and to admit of air flushing, the top part is pulled down. This often produces contrary currents, and half of the window at least is obstructed by the area of the sashes, which must remain in position. After experience with both kinds of window, it is claimed that the centre-hung lights

have the best of the argument. Until recently, windows have been regarded as necessary for both ventilation and light; but at North Wingfield, in Derbyshire (about seven minutes from Clay Cross Station), in an experiment which it has been the privilege and pleasure of the writer to carry out, the two have been obtained separately. The ventilation is independent of the lighting, and depends upon doors continuous along two sides of each room. Each door is made so that (1) the whole of it will open, (2) the top half will fall down, (3) the top half will fall inwards a distance of 4 ins. to act as a hopper. By this means, each side of the building can be wholly open, half-open, or hopped. It offers such opportunities for regulating the ventilation, and has proved so successful, that it is hoped to arrange several more schools on these lines. The experiment at North Wingfield was threefold, and was a complete departure in its arrangements

airiness and cheerfulness are two of the things to be aimed at.

Lighting. The next matter we must consider is that of lighting, about which perhaps there is and has been as much discussion as ventilation, and as many differences of opinion. Until recently, it was regarded as a *sine quâ non* that vertical windows in the walls should be the means of both lighting and ventilation, but there is really no reason why this should be so. Rooms may, of course, be lighted in many ways. The lighting may be at one or both ends, in which case teachers and children will have the light in their eyes, and this system stands self-condemned. The lighting may be by means of a side window and an end window, but the objections to the end window still hold good, and this method should not be adopted when it can be avoided. There may be cases in connection with old buildings where, short of pulling the building down, this is

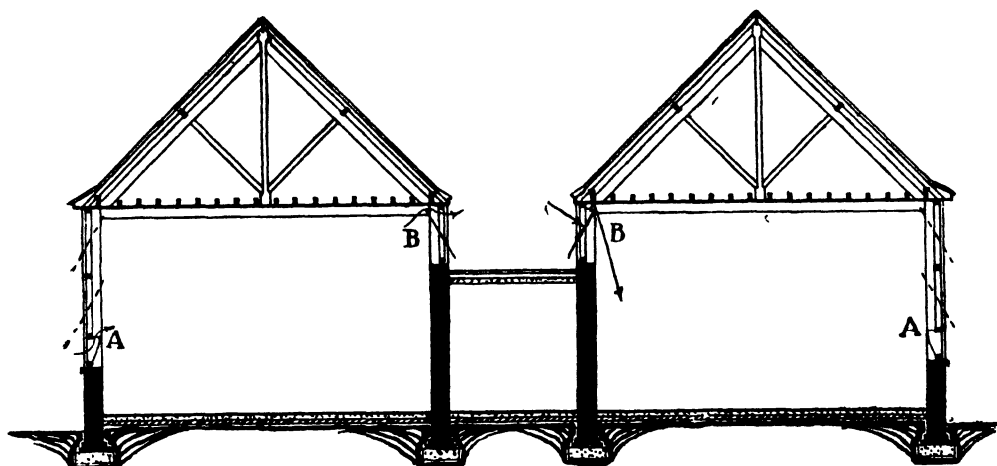


FIG. 8.

for ventilation, lighting, and heating. The two last will be referred to later.

Before leaving the question of ventilation, one is constrained to utter a note of warning. We have seen that to change the air in a room, openings on both sides are necessary; and, further, that the lower the openings in the wall, the better and more thoroughly will the air be changed. There is a tendency amongst many architects to produce a type of plan which professes to have cross ventilation, but does not fulfil the necessary conditions for thorough as well as through ventilation. Many schools have been planned recently with rooms in double rows and a low corridor between. This arrangement is not a great deal better than the old central-hall type of building which we have considered. It is claimed that there is an external window to each room above the corridor which permits of cross ventilation; but if the smoke test be applied, it will be seen that if the air enters at A, it will short circuit across to B, leaving the main body of air with little movement (Fig. 8). If the air enter at B, it will hit the ceiling at once and descend in an uncomfortable manner. This method is really a variant of the old roof extract referred to previously (see Fig. 6), and should not appear in new buildings. Moreover, the corridor being low and dark, gives a depressing effect to a school where

the only means of dealing with a room; but in the case of new buildings, there should be no reason for such an arrangement. We are, therefore, left with three methods of lighting, that is to say, vertical windows on one side, vertical windows on two sides, and skylights.

In the case of unilateral lighting, it must be acknowledged that the majority of English specialists and practically all the continental ones are strongly in favour of lighting from one side only. On the other hand, the writer has to state that he has never seen any *proofs* that the shadows resulting from bilateral or trilateral lighting are injurious to the eyes. It will, of course, be admitted by all that lighting from the left with shadows as far away from the vision as possible is the most restful, but this does not prove that other systems are dangerous. Wherever possible (and the exceptions ought to be few indeed), the lighting should come from the left; but, if vertical surfaces are to be used for lighting and also for ventilation, windows on both sides are necessary, and then a multiplicity of shadows results. This can be met by placing the windows on the right of the scholars under a verandah roof, but it means that a large amount of glass will be required in the left wall to get the requisite amount of light in the darkest part of the room. The windows under the verandah will give

no light to the room, and they should be regarded as for use as ventilators only. Sometimes windows such as this are called "borrowed lights," but few seem to realize that often the light is weakest on the side whence light is supposed to be borrowed. It is often a great difficulty for school managers to grasp this fact, and only the use of a proper instrument for measuring light can prove the fact to them. Another point to be remembered is that windows

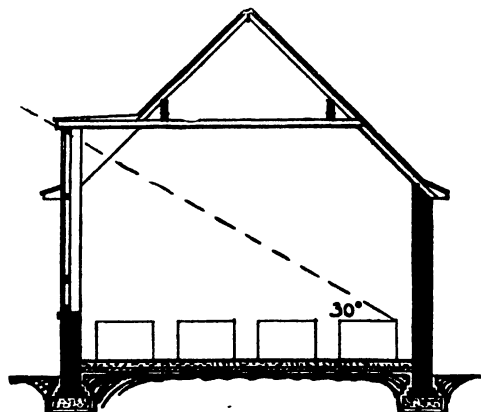
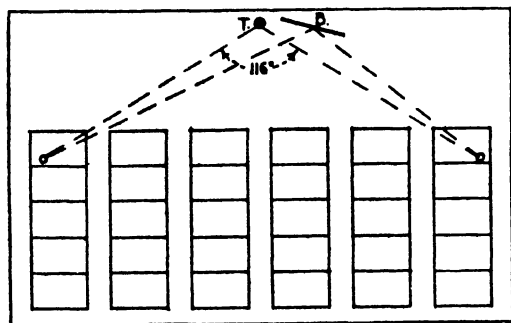


FIG. 9.

should be carried as high as possible, as the light coming through the top of a window, even when there is no obstruction, is more powerful than that entering at the bottom. With this we shall deal presently. It has been found by practice that, under normal conditions, the glass area of windows should be one-fifth of the floor area. But it also follows that as much as possible of this glass area should



B. Blackboard.

T. Teacher.

FIG. 10.

be carried up to the ceiling, or to such a height that a line drawn from the top of a desk farthest from the window to the top of the window glass itself, does not make an angle less than 30° with the horizontal, as shown in the accompanying sketch (Fig. 9). Under normal conditions, it will be found in cases such as this that the light falling on the desk in the darkest part of the room does not go below 1 per cent. of the light falling on the windowsill. To many this will seem a very small proportion, and if the ordinary person is asked how much light reaches the back of a room, the guess will often be 50 per cent. Those who photograph will, however, remember the very short exposure necessary outside and the much longer exposure necessary for

indoor photography. After much study of lighting problems, the Illuminating Engineering Society has come to the conclusion that the 1 per cent. standard is a reasonable one for schools, and with their opinion most people will agree. The glass area of one-fifth of the floor is sufficient in rooms up to 20 or 21 ft. in width; but if this width be exceeded, the glass area will need to be increased possibly up to one-fourth, but no room should be more than

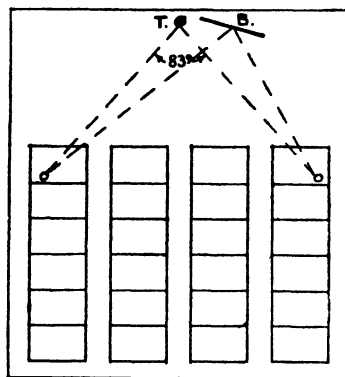


FIG. 11.

25 ft. wide. The nearer the rooms are kept to 20 ft., the better for all concerned. Not only is lighting improved, but the angle of vision is reduced also, and this benefits both teachers and children. The teacher obtains more easily a full view of the children and the children can easily see the blackboard (see Figs. 10 and 11).

While the glass area and angle of elevation must be considered, these are not the only factors in

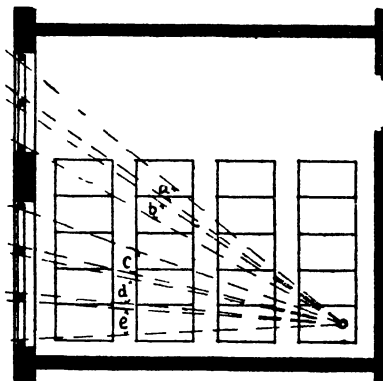


FIG. 12.

daylight lighting of schools. It will be obvious to all that a building with a clear outlook will receive more sky brightness than one looking out on brick walls or thick banks of tall trees. From calculations and observations made by Dr. Kerr of the L.C.C. and Mr. P. J. Waldram, it has been shown that from the least lighted desk in a classroom, 50 square degrees of sky should be visible. That is to say, the angles of sky visible horizontally at the top of the window from the least lighted desk (Fig. 12) multiplied by the average vertical angle from the same point (Fig. 13) should give 50 square degrees.

It cannot be expected that all teachers and others engaged in educational work should carry about instruments for measuring light; but there is no reason why the deductions of specialists contained (1) in the relation of window area to floor area, (2) in the angle of elevation of the window head, and (3) in the area of sky visible, should not be used by all who have reason to believe that the rooms in which they teach and spend so much time are improperly lighted and producing bad results.

In most single-story schools, when the sites are not cramped and hemmed in by buildings, it will be found that when the lighting receives proper attention the least lighted desk will receive about 2 per cent. of the sill reading. In the North Wingfield experiment, the weaving shed type of lighting was adopted; that is to say, on the north side above the verandah was placed a continuous skylight inclined at an angle of 60° with the horizontal.

and to make our schools as cheerful as possible. Nothing, after the personality of the teacher, helps to make work successful so much as a cheerful building, and many a teacher's personality has suffered through being confined amid dismal surroundings. It is often the little things that count; and so small an alteration as the lowering of a picture rail to give more white surface for reflection by bringing the white of the ceiling down to the rail, will, especially if light and cheerful colours be used elsewhere in the room, make more difference to teachers and children than can be expressed. This is no sentimental faddism, but solid fact, which can be observed by all who will take the trouble to see for themselves.

One other important point in connection with lighting remains to be noted, and that is the *artificial lighting*. Here we come up against a curious fact. In the photographic dark room the

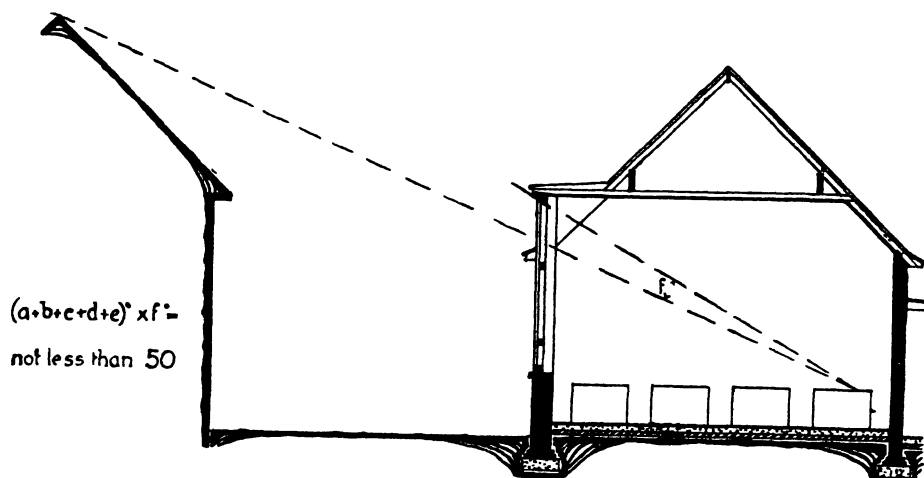


FIG. 13.

This skylight gives a reading of 5.18 per cent., an amount which it would be next to impossible to obtain in an ordinary classroom with vertical windows. Moreover, it shows how much more valuable light is from near the zenith than from near the horizon. Apart from the position of the source of light, it is necessary to remember that horizontal rays have to traverse a greater distance through a more dense layer of air than is the case with nearly vertical rays. In a vertical window, too, more light is concentrated at the top than at the bottom. If we assume that the illumination is derived from an unobstructed hemisphere, and that a classroom has one side which is entirely of glass, it will be seen that, although the hemisphere is divided into equal parts, the window is not, less area at the top of the window being required to admit the light from the upper sections of the hemisphere. It must not, of course, be assumed that we should have four walls and windows only at the top; such rooms are most depressing. At North Wingfield the doors below the verandah are glazed the full depth, thus enabling all to see out, and counteracting the crushed and hemmed-in feeling of the old skylighted brick walls. This country was a long time before waking up to the necessity of good, cheerful lighting, but great efforts are now being made to remedy the defect

eye will adapt itself to the fraction of a foot-candle, it will also adapt itself to thousands of foot-candles outside; yet for steady work by artificial light in schools, the light must not fall below $2\frac{1}{4}$ foot-candles nor rise above three at the level of the desk if eye strain is to be avoided. Thus the minimum of natural light becomes the maximum of artificial. For this reason, the lights require careful consideration not only to avoid awkward shadows, but so that the light shall be full and constant. With electric light, it is often arranged that lights can be raised or lowered, with the result that lights are brought down, give an intense glare, produce eye strain, and cause the sufferer to blame the kind of light. Therefore lights should be so arranged that they cannot be pulled down below a level at which safe and proper lighting is obtained at desk level. In addition to this (and just as important), is the need for screening the flame or filament from the eye. There are excellent shades and globes obtainable, which, by shape and by means of prisms, direct the light more or less evenly on the surface to be illuminated, keep the eye from the actual light, and produce a feeling of restfulness. No light should be less than 8 ft. 3 ins. from the floor, so that children looking at the blackboard do not have their vision interrupted by the lights. Moreover, the light illuminating the blackboard

should have an opaque screen for the same reason, especially if the schools are used in the evening. In manual shops and in rooms used for dressmaking, it will be found desirable to increase the artificial lighting up to four foot-candles.

Heating. There are various ways by which schools may be warmed, chief among these being grates and stoves, warm air, high-pressure steam, high-pressure hot water, low-pressure hot water, and low-pressure steam. Undoubtedly the most cheerful is the open fire, but it is the least suited, by itself, for satisfactorily warming a school. A room may be closed up and the temperature raised to proper height before the children come, but the few minutes occupied by keeping the doors open for the admission of children may be sufficient to dissipate the heat which it may have taken two or three hours to produce. The heat being given off in one place, it follows that those nearest the fire may be scorched, while those at the back of a class may have their fingers blue with cold. If windows be kept open in cold or even cool weather, heating by grates will also soon be found to be a failure. The same remarks apply to stoves; and those of the slow combustion type, especially if improperly designed, vitiate the air, cause the skin to feel dry, and often produce headaches. Of the systems of warming by hot air, one is by natural means governed by the difference in the weight of the air; the other by mechanical means where the air is either forced through a building, or sucked through, or both. In the former case, there is some difficulty in getting sufficient air to prevent smell and stuffiness in the rooms, and alterations in the wind may affect the amount of air reaching the rooms intended to be warmed. Often the defect is produced by providing inlets, but no outlets. It follows, as we have seen at the beginning of this article, that if air is to circulate properly, there must be outlets as well as inlets. This system may be satisfactory for rooms with few people in them and where the climate does not vary in the winter as with us, but in this country one has yet to find an installation that can be regarded as suitable for schools. In the case of mechanical ventilation, there can be little doubt that pure air in plenty can be obtained where a proper installation is not only provided, but carefully looked after. In this system, the air is brought through a screen to remove the dust, and by means of running water is washed. It is then heated and passed through ducts to the various apartments. Now, in many of these, the ducts have been made so small that it is impossible to keep them properly cleansed, and one fears that the screens are often improperly cared for, the consequence being that, although dust gets taken out, other dust is churned up, and analyses have proved that in some of these forced draughts twice as many microbes per cubic centimetre can be found as in the ordinary air. For a mechanical system to work properly, every door and window must be kept shut, and this must be regarded as a very serious drawback. It is useless teaching the children to live and sleep with open windows if they are to see that teaching flatly contradicted in the buildings in which they work. It is quite easy to explain the difference between the school and their homes, but the children will get an association of ideas, and will not notice so readily when at home that the windows are shut. If the children are to learn the value of the open window, they must learn it at school and look for the same thing at home. It is sometimes put forward by the advocates

of mechanical ventilation that the temperature remains constant during the year. One is glad to see that this is now looked upon as anything but a blessing, and that, provided the body be warm, cold air is now regarded at its true value as a good tonic. This constant temperature, coupled with the closed windows, produces a confined, unnatural feeling with a certain amount of depression.

High-pressure steam or high-pressure hot water are not to be commended. Safety above everything must be considered in a school, and neither of these systems may be said to satisfy this test. The Board of Education have wisely issued a circular pointing out the danger, and calling upon local authorities to have periodical inspections made. One county at least has done the thing thoroughly by removing these high-pressure systems and installing low-pressure hot water. In ordinary schools, and more particularly old buildings, low-pressure hot water will be found the most practical and economical method of warming. There is only one fire to be kept going, and this fire can be regulated; a large proportion of the heat gets into the hot water, and the pipes by being carried all round a room give off heat both uniformly and constantly. If doors be left open for a few minutes, any excess of heat can be got rid of, and there is not the discomfort that attends the heating of classrooms by open fires. Moreover, if some of the pipes and any radiators are controlled by valves, it is an easy matter to turn off these and thus reduce the heat in mild weather. To realize the change that has taken place in recent years, one has only to compare the heating surfaces of, say, fifteen years ago with those of to-day. Then, 8 to 10 sq. ft. of heating surface per 1,000 cub. ft. of contents were regarded as sufficient, and heating engineers were fond of assuring their patrons that a temperature of 60° could be maintained in the coldest weather. They did not follow up their statement by pointing out that this meant that every door and window had to be kept shut. Ventilation was regarded as of little moment when schemes such as these were prepared. Now it is customary to provide from 30 to 35 sq. ft. per 1,000, an increase from three to four times the heating surface of old. As we have seen (p. 228), hoppers can be made to admit of the air being changed ten times per hour with a breeze of 4 miles per hour. In a room for fifty children, there will, by the Board's Regulations, be 7,000 cub. ft. of contents or 70,000 cub. ft. of air per hour to be warmed. A British Thermal Unit will raise 50 cub. ft. of air 1° in one hour; therefore the B.T.U. required in this room will be $\frac{70,000 \times 28}{50} = 39,200$ B.T.U.

per hour, assuming the outside temperature to be 30° and the required temperature inside 58°, a difference of 28°. A square foot of heating surface will give off 1.75 B.T.U. per hour for each degree (F.) of difference between temperature of pipe and air. If the pipe temperature be 150°, there will be a difference of 150°-58° = 92°. The area of piping will, therefore, be $\frac{39,200}{92 \times 1.75} = 244$ sq. ft. This is equivalent to 35 sq. ft. of heating surface per 1,000 cub. ft. of contents. If the rooms have a constant height of 14 ft., and the floor area be 10 sq. ft. per child, this may be regarded as requiring 5 sq. ft. per child; or, in other words, the heating surface required will be one-half of the floor area.

There are two more things to be remembered in

installing a heating apparatus, one being that if economy of fuel is to be a consideration, the boiler should be at least 50 per cent. in power above the work it is called upon to do. This means that the boiler will not need constant attention, the fuel will burn more slowly, and less will be required. The other point is to see that all boilers are provided with a dead-weight safety valve. In installing hot-water systems in old buildings, the greatest expense used to lie very often in providing a heating chamber. This chamber is no longer necessary in schools of four or five rooms, as two firms at least have brought out boilers which can stand in one of the classrooms, and one boiler will be sufficient to heat the pipes for the whole of a school of this size. By the decision of a Local Government Board Auditor (Derby Borough Education Committee Accounts), it is permissible for authorities to contribute towards the cost of a new apparatus in an old non-provided school, and there is no reason why the children who are our first care should not in all cases be properly warmed and provided with an ample supply of fresh air. The last system of heating which we will consider may also be regarded as the latest. The Medical Officer of Health for Derbyshire suggested that it might be a good thing if we reverted to the old Roman system of heated floors. Attempts have been made to heat rooms from the walls, but with somewhat indifferent results, because the feet tended to remain cold. Dr. Barwise suggested that if we could warm the children's feet, the blood would circulate, their bodies keep warm, and the children be able to inhale colder air than would otherwise be the case. In the experimental rooms at North Wingfield, to which reference has already been made, it was the writer's privilege to put this to a practical test. The difficulty at the beginning was to know what the surface temperature of the floor should be. If too hot, the children's feet, not to mention the teachers', would become tender. If kept low, would the children be warm enough? Experience now shows us that a surface temperature of 75° is sufficient. As there is a large skylight to these rooms, a 2-in. steam pipe is fixed round each room to prevent any possible down-draught; and on a winter's day, with outside temperature 38° and plenty of ventilation, the temperature at 1 ft. above the floor was 59° and at 6 ft. 57°. All the heating arrangements being out of sight, the rooms have a much neater appearance, and there are less ledges for dust. The construction of the floor is quite simple, and consists of concrete slabs 2½ ins. thick, with a space of about 9 ins. below in which are steam pipes. Below the steam pipes is a bed of concrete 12 ins. thick. The boiler works with a steam pressure of 3 lbs., and is fitted with an automatic draught regulator. Thus, the loss of heat from the surface of the floor is made good with the heat of the steam pipes in the space below; these, in turn, take off more heat from the boiler, the boiler regulator opens, and more heat is generated. It may, perhaps, be said safely that this is the simplest form of heating and the neatest in appearance. The calculation is very simple, as the air in the trenches is confined and does not lose heat by circulation. All that has to be done is to proportion the surface and temperature of the pipes to the floor area and temperature required. Thus, 1 sq. ft. of heating surface at 212° F. will heat a floor area of $\frac{112}{75} = 2.82$ sq. ft. at 75°. The extra heat above 212° due to the steam pressure may be

regarded as equivalent to the heat lost downward. The floor paving is made in sections for easy removal, so that access can be obtained to any part if required. On another occasion, it is proposed to adopt a system of trenching for access which will enable a permanent floor to be laid. It seems more rational to heat a substance in contact with part of the body than to warm the air surrounding the body, which can be blown away almost as quickly as heated. From experience, it would appear that this method of heating is as cheap as low-pressure hot water, and has the advantage that there are no pipes to be frozen up in cold weather. It has also the advantage that rooms are sufficiently warmed within two hours or so of getting the fire going in the boiler. One ventures to think that this system of heating may be of use in buildings other than schools. We have now considered in detail the important questions of ventilation, lighting, and heating. It is most important that these should be fully grasped, as upon them hang all other points. It is useless trying to express ourselves in plans unless we have a thorough grasp of the principles that ought to govern us in the production of those plans. When these are fully grasped, there is a directness and definiteness that at once arrests attention. This can always be seen in a special manner in a competition for plans for a school, even those least used to drawings being able to see and know when the author is expressing ideas which differentiate him from many others.

Sites. We will now proceed to consider more or less in detail the various educational buildings, elementary schools, open-air schools, secondary schools, technical colleges, etc. In every case, the most important thing at the start is the site. Too much care cannot be expended upon selecting a suitable piece of ground whereon to place the buildings. In the case of elementary schools, we hope that the day has gone by when the main streets and roads were considered the most suitable. In these days of fast motor traffic, trams, noise and dust, it is essential that the schools should be kept away from the main arteries of traffic as much as possible. When the children come out of school full of childish energy and spirit, it is well they should have a space to traverse in which "to let off steam" before getting amongst the traffic. Some day we may be able in our towns to plan our schools in the suburbs, and take our children to and fro in trams or 'buses, and get them quite away from the noise. The next point is to select a site that shall be the most cheerful that can be obtained. Access of sunlight is, of course, an essential thing, but there are other points which add to cheerfulness (e.g., absence of lofty and grimy buildings, presence of trees and gardens, wide streets in towns, and so on). In the country, the difficulty is not so great; but mushroom growths in colliery villages, and the grabbing of land by speculators without conscience, present difficulties almost as great as in towns. Owing to the unreasonable demands made by these people, it is sometimes hopeless to try to get a site as large as one would wish. Open spaces around the schools are the lungs of a neighbourhood, and as they do not benefit only the children in the school, it is always desirable to get as much land as possible. The Board of Education ask for a quarter of an acre for 200 children, but it is desirable to regard this as a minimum and not as a counsel of perfection. A suitable area for school buildings and playgrounds

has been found by experience to be about 10 sq. yds. per child. This will give good playgrounds and enable the buildings to be set well back from the front boundary line. The space between the front boundary line and the building ought always to be given up to Nature. The presence of bright flowers, trees, and shrubs all properly cared for by the children themselves, will give a dignity to a school, make the children feel the school is really theirs and a place to be loved, and produce an atmosphere which will as a natural course affect both children and parents. If the lie of the land permits, it is desirable that trees and shrubs should be planted elsewhere, provided, of course, that they are not so placed as to interfere with the healthy romping of the children. We need to be always trying to uplift people, and can best do so by uplifting ourselves and giving those around the school something to love. If they have trees and flowers in their midst reared by their own children, the most hardened of humanity in the slums and elsewhere may be led to a better life. Love of creation will, we hope, lead to love of the Creator. The speculating builder with his row upon row of houses, and street upon street all dismally alike, has helped to crush out nearly all self-respect, and to make people doubt whether there is a Divine Creator. Let us see to it, then, that we who have the care of the children and the production of the children's workshops in which their characters are made and moulded, give them of the best of God's fair earth, and help to undo the evil produced by the conscienceless jerry-builder. There is no need to pander to the children and wrap them up in the lap of luxury. Children are natural, and love simplicity and all that is beautiful in Nature. Let us see that they get it, and let us help them to keep their nearness to the divine as long as we can. Another way in which their characters can be helped in a right direction is by the provision of playing fields. A game of cricket or tennis will teach children to act together and get rid of self. It is doubtful whether we have yet learned the good that these organized games can do when properly controlled and not allowed to become the all-absorbing part of the day's work.

In open-air schools there can, of course, be no doubt that the best possible site should be obtained. Few laws and rules can be laid down. Those who take this work in hand almost invariably have good hearts, and they may be safely left to do what is best under the special circumstances of each case. It is sometimes urged that there ought to be no need for these schools, but one doubts whether this sentimental view is not the wrong way of looking at things. The chief thing in education is, or ought to be, the formation of character. In the present materialistic age, one fears that this is too often lost sight of. Character, the development of all that is best in our inmost being, the merging of the finite in the Infinite, is too often the last thing and not the first—if, indeed, at times, it finds a place at all. In the formation of character, there is no force, perhaps, more potent than suffering. It uplifts the sufferer, and calls forth love and self-sacrifice in those who minister. So we must be thankful that we have the privilege of ministering to the suffering and helping their lot by means of these open-air schools. On the other hand, we ought to see to it that the causes which produce so many of the cases are removed. Had our forefathers controlled the development of land and put the speculator in his

place, many an unhealthy body would now be sound and would be able to minister instead of being ministered to. As we have sown, so must we continue to reap. In secondary schools, owing to the smallness of classes, the number of special rooms required, and the attention given to games, a considerable area is required, which, of course, must vary with circumstances. In a school of 100 children, the Board of Education asks for at least 2 acres in the playing-field alone. It will probably be found that for 600 boys, a field of 10 or even 12 acres will be required. All sites should either be level, or lend themselves readily to leveling, if economy is to be considered, and every attempt should be made to bring out the natural features of site and surroundings. We cannot give age and tradition to our modern schools, and we ought, therefore, to do our best to produce charm and character, so that each student may ever look upon his school with love and respect.

Because playing-fields are not necessary at technical colleges, it is too often the case that sites for these colleges are of the smallest possible dimension, with hardly any regard to air and possibility of extension. These institutes are invariably in the midst of densely-populated neighbourhoods where land is dear; but we ought to remember that if a thing is worth doing at all, it is worth doing well, and that people will work better where there is plenty of air and a feeling of spaciousness. Parsimony is not economy; as a rule.

Elementary Schools. In considering an elementary school in detail, the first and most important thing must be the *classroom*; but, strange to say, there is little more to be said. We have already considered the vital questions of lighting and ventilation, and, where these are properly met, the classroom has practically planned itself. We have also seen the desirability of having light and cheerful colours on walls, ceilings, and woodwork, and this leaves only the daddoes to speak about. The craze for free-arm drawing seems to be passing away, but it is still desirable to have the daddoes prepared for drawing so that both teachers and children may express themselves in drawings and diagrams. The most restful colour is perhaps a dark green, but in this case the colouring has to be upward. Another colour, and one more serviceable for its purpose, is a silvery French grey. This being a medium colour, neither light nor dark, the operator can work both up and down, that is to say, both light and dark chalks can be used. At the bottom of this space, a chalk rail should be provided. It is only a small matter, but adds much to the neatness of a room. Where wood floors are in use, it is better to fill up the pores of the wood as soon as laid with oil preparation, terebine, or one of the wax polishes now on the market. One of the greatest difficulties to be faced in a classroom is the furniture. (See EQUIPMENT, SCHOOL.) Desks are admittedly a compromise, inasmuch as one slope has to answer for reading, writing, sewing, and other handwork, whereas different inclinations are required for each. Moreover, desks are cumbersome, and the daily school cleaning puts a strain on the caretaker, especially if it be a woman. Possibly we may soon come to having light folding tables with tops that can be flat or raised, and a separate chair for each child. If the tables be numbered where easily seen and the chairs also, it ought to be possible to arrange suitable furniture for each child, whether its body and legs be long or short. It is possible for negligent

teachers to allow the children to take up wrong positions when writing by pushing their chairs too far back, but in this life we cannot expect to get perfection. With light folding tables and independent chairs, the classes can be grouped better for drawing; and in summer weather, if trees abound, it ought to be quite an easy matter to convey the furniture to the shade of the trees and have lessons in the open. It may be urged that children are naturally fidgety, and that there will be much noise from constantly moving tables and chairs; but one must remember that in secondary schools it is customary to give separate chairs, and if it be possible to work quietly there, it ought to be equally possible to work quietly in an elementary school. In this, as in much else, a good deal depends upon the kind of teacher. In the case of movable tables, there is the drawback that there are neither shelves nor lockers for the children; but this can be got over by providing a series of cupboards forming part of the structure on the wall in front of each class.

that the smell may be carried out and not find its way into the classrooms. In most schools, and especially in country districts where the children have to walk great distances, it is essential that the cloakrooms shall be heated so that the children's clothes may be dried before they are required for the return journey. This can be done by putting hot water through the tubing of the cloak stands, or by providing pipes and radiators under the clothes. If no hot water be available, this is probably a case where a slow combustion stove would prove efficient and economical. A point to be remembered is the height of the clothes rails, which are often placed too high. For infants, the two rails should be 2 ft. 9 ins. and 3 ft. 9 ins. respectively, and for older children 3 ft. 9 ins. and 4 ft. 9 ins. For lavatory basins, probably the best thing is the glazed stoneware trough. With these, each child has a tap, but there is only one outlet which has no plug. Water cannot, therefore, stand in the trough, and children are bound to wash in

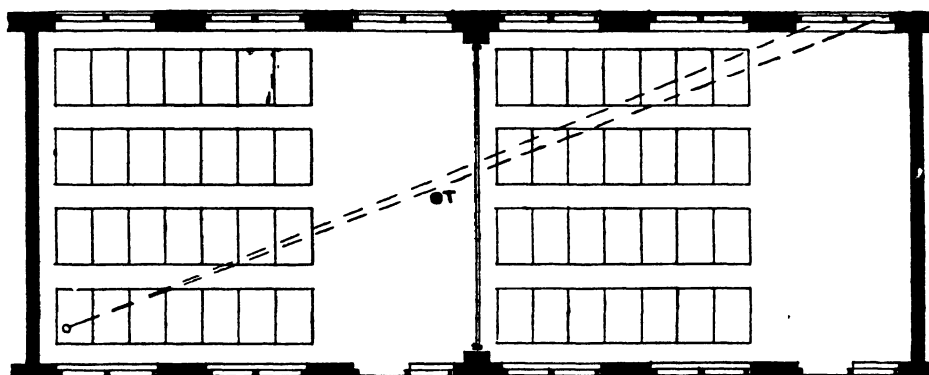


FIG. 14.

Two large cupboards, one at either end, can be provided, and dwarf cupboards between, care being taken that they are kept up from the floor so as to allow the space at the bottom to be properly cleaned. The top of the dwarf cupboard can be provided with a museum with glazed lift-up lids. Another advantage of movable tables in lieu of desks is seen in wet weather, when physical drill has to be taken indoors, especially if the sides of the classrooms can be opened. Many a teacher would rejoice if the floor could be left clear of furniture when physical drill has to be taken in wet weather. As it is, it is good to compare a modern room with a cramped room of the old type with a gallery. Progress may be slow, but we realize that a very real progress is indeed taking place. It is sometimes desirable to have two rooms divided by a folding partition. When this is necessary, the partitions should be of wood with the minimum amount of glazing—in fact, the glazing should be little more than peep-holes. The reason for this is that two rooms so divided practically become one long room, and a child sitting at one end and looking forward catches the light from the windows at the side of the second room owing to the narrowing of the angle of vision. The accompanying diagram will show this. (Fig. 14).

Our next consideration must be the *cloakroom*. Here, as elsewhere, the space required is regulated by the rules of the Board of Education, and one cannot emphasize too strongly the need for having these rooms provided with through ventilation, so

clean water. The taps are of spray pattern, and the amount of water used by no means great. The spray of the taps should not be more than 2½ in. above the edge of the trough, if splashing is to be avoided; and no trough should be more than 2 ft. from the floor for older children and 1 ft. 10 ins. for infants. It would be a good thing if all cloakrooms could be provided with large mirrors, especially in the case of girls, so that each child could see itself from head to foot before leaving, and learn to take a pride in neatness and tidiness. As mirrors are expensive, it might be best to have them in squares framed together, in appearance somewhat like those sometimes seen at picture palaces. Any damage could be more cheaply made good.

MEDICAL INSPECTION ROOM. Medical inspection is now an important thing in school life. If the school be a large one and the neighbourhood not of the cleanest, a bathroom should be provided, so that the school nurse may see that children are sent to the medical man in a fit state to be handled. Hot and cold water will be required. In every room used for inspection purposes, there should be a clear, unobstructed distance of not less than 20 ft. for eye-testing. In addition, there should be a cupboard not less than 6 ft. by 4 ft., which should be ventilated, but able to be completely darkened for use by the oculist with his lenses. A waiting room with lavatories should also be provided.

TEACHERS' ROOMS, especially for female teachers

should be made to have a homely and restful feeling, more particularly so if any remain at school for meals. There are some good grates on the market now which can be converted into ovens, or are provided with an oven at the side. These are a boon to teachers, as they combine the ability to cook food with the cheerfulness of the open fire. Lavatory and w.c. should always form adjuncts to a teachers' room, and provision should be made for hats and cloaks. A store room for school requisites is best provided not far from the head teachers' room. This room should be lighted, ventilated, and warmed. Medical inspection, teachers, and stores are, as a rule, best provided for on the first floor, as there is more quiet and privacy. As cloakrooms need not be more than 8 ft. high, and as classrooms are usually 14 ft., it is customary and economical to make use of the space above the cloakrooms for these purposes.

The space below the cloakrooms is usually used as a **HEATING CHAMBER**. This is best when centrally placed, so that the circuits may be as nearly equal as possible. It is a grave mistake to cramp a heating chamber, as so much room is required for fuel, in addition to the apparatus. Easy means of access for carts must not be overlooked, and provision must, of course, be made for the easy removal of ashes. In addition to the system for heating, an auxiliary system should be installed for providing hot water for the caretaker for cleaning purposes. This can deliver over a sink in the cloakroom, will save the caretaker no inconsiderable amount of unnecessary labour, and conduce to better and more frequent cleansing in the school. An extension of this same auxiliary system will provide hot water to the teachers' lavatories and to the bath for medical inspection.

CONVENIENCES. Wherever there is a water supply, there should be water closets. These are the simplest and least objectionable. Each closet should have a separate pan and cistern, so that each child may learn to look after itself, which cannot be the case when automatic tanks are used controlled by the caretaker. The greatest difficulty to contend with is frost, and the writer has found the best method to contend with this is to provide a chamber at the back of the closets with a tortoise stove in it. The cisterns instead of being placed in the closets are placed in this chamber, the pull, of course, being in the closet. The supply pipe is provided with stop and draw-off cocks; thus by shutting off the water, pulling each cistern, and opening the emptying cocks, the pipes and cisterns can be left empty at night, and this will prevent all fear of danger should the fire go out. By day the pipes can be left full for use, and the fire will prevent freezing. The traps of the pans are also brought through the wall, and the heat playing on these prevents freezing here also. As out-offices are usually detached, it is necessary to take these precautions. If the out-offices adjoin the school, it is possible to continue the heating pipes and obtain similar results. In country districts where no water supply is available, it will probably be found that pails are the best method. These should be emptied at least once a week. The greatest difficulty is the urine in the girls' closets, but this can be got over by setting apart certain closets, and fitting them up with hopper pans for use as girls' urinals, and provided with drains connected to the drainage system. The doors to these can be marked "1" and the pail closets "2." The

interesting fact is that children seldom or never misuse these, and thus the difficulty of getting rid of the liquid excreta is removed. In the pail closets, a liberal supply of dry earth should be provided. This is the Mosaic and natural method of treating excreta, and by this means much of the objection to pail closets can be avoided. In Hampshire, some of the schools are provided with shallow privy middens, and treated to a liberal supply of earth. This is removed, paper included, and shut up in a dark chamber. After a time, all is reduced, and can be used over again for covering the excreta in the privies. By this means a constant supply of dry earth is available.

Urinals for boys are best without divisions. The walls to a height of about 4 ft. or 4 ft. 6 ins. should be rendered with cement, and then given two coats of pitch and tar applied hot. This coating will prevent the urine from getting into the cement, and should be renewed every two or three years as required. If the caretaker mops down the walls frequently, there should be little smell observable.

We have now considered the things that may be regarded as essential in all schools. We now come to those which, although not essential, are desirable, and foremost amongst these must be placed the **ASSEMBLY HALL**. These halls are often not used as much as they should be, and consequently are regarded as a waste of money. When properly used, they are of great service, and give a centre and unity to the whole school. It is best to have the hall quite detached from the school proper, so that noise at games or singing may disturb the rest of the school as little as possible. Moreover, if the hall be required for evening use, the detached hall can be left undone while the rest of the building is kept locked. Verandahs should be provided on each side with plenty of doors opening into them, so that, in the event of physical exercises being carried out there in inclement weather, as much air as possible may be obtained. A platform at the end should be provided, and if drawing be taught in the hall, the space under the platform can be used for storing the apparatus. There should be no insuperable difficulty in using the hall for the teaching of science. This in an elementary school will not be of an advanced order, and the only special requirement would be a bench for the demonstrator. It is certainly desirable that halls should be used more than appears to be the case at present; in fact, a hall might, by a little thought and care in organization, be used continuously. In some cases, halls are used for cookery; but, unfortunately, this has not proved to be altogether a success, due in a great measure to the amount of apparatus required and the length of the lessons. A hall of this kind tends to become solely a cookery room, and if there are sufficient schools in the neighbourhood it might very well become a cookery centre. It would ensure continuous use and a return for the money expended, which is not inconsiderable.

In **MANUAL SHOPS** the tendency should be to keep these simple, and to make it appear that they are really and truly intended for work and for the application of brains to that work. Air in plenty is very necessary, as heat and moisture from the body are more apparent. It is a good thing to have one side at least with doors opening down to the floor. A good impression of a workshop received in youth will make an insistent demand that all workshops shall be on hygienic lines. Hitherto it

has been the custom to fill these workshops with movable benches. They require far more floor space, and give a fussy and somewhat untidy look to a building. A wall bench is far more rigid, and the wall space above provides a useful and handy place for tool racks. There would appear to be no reason why one long wall should not have fixed benches which could be returned on the end walls. This by itself would not provide sufficient bench space for a full class, and the deficiency could be made up by either a few movable benches or a long fixed one down the middle of the room. Woodwork should not be the only thing considered. Much interesting and useful work can be done in smithing. By this, one does not mean merely bent ironwork, which has been run to death. Beaten ironwork and forging are useful things for a boy—especially a country boy—to learn; and, if we could get good men to check the designs and supply ideas, we might get back to the days of our forefathers, when every utensil in a house was a work of art and would bear inspection. Beaten lead and copper work might also be encouraged, and also wood-carving as apart from joinery. Why should not every cottage have a bread trencher carved by a child at school? Why should not the domestic candlesticks be made by villagers at evening classes in rooms such as these? We are all tied and bound by the chains of mechanical manufacture, and have, as a nation, lost appreciation of the beauty and dignity of handicraft. It is sometimes urged that these buildings cost money, and that country villages cannot afford them. Such is by no means the case if only we will agree to put up buildings in wood. Nothing lends itself better to producing pleasing effects than timber; but with the rage for machine-made goods has gone the taste for timber structures, and hard-and-fast drastic by-laws have not made matters better. Those who would wish to see what can be done, cannot do better than see the school (and schoolmaster) at North Somercotes, near Saltfleet, in Lincolnshire. There a combined manual and cookery room (all in timber) has been erected at a cost of £50 (pre-war). It is not handsome and it is not ugly—just practical. It is not perfect either, but it shows a first step; and there is no reason why a really useful and artistic building should not be erected in every village in the country. One does not say that smithing and forging should be taught in a wooden building, but a small inexpensive annexe could provide for the forge. "Where there is a will, there is a way," and much more can be done than at present.

BUILDINGS FOR DOMESTIC WORK. It might be thought that the teaching of domestic subjects should present little difficulty, but more is experienced here than in any part of the school. The cry is that we must be practical, that we must teach the children under conditions such as they have in their own homes, that we must not put them above their surroundings. Let us take the case of a cookery class with eighteen children in it. How is it possible to put eighteen children in a room the size of a cottage kitchen and let them all cook in and on a cottage range? If they are all to do work, it means a large room and apparatus different from that in their homes. The nearest approach to the actual conditions of life is to hire cottages and let the children work in them. But here again is a difficulty. Metal-work gets polished so often, that it is never dirty because nobody lives in the house, and teachers cannot be expected to live there with

strange children turning their cupboards and drawers inside out. Moreover, only a few children can be taught at a time in a cottage, and expense in teaching becomes an item. Perhaps some day we may realize more fully that money spent on domestic training is money well spent, and we may be prepared to let the children live and sleep in these cottages for a few weeks at a stretch, and run the houses, under the guidance, of course, of a teacher. Then we might get somewhat near the ideal of training children under everyday conditions. It is not merely cookery that requires teaching, but the whole of housecraft even to the choice of wall papers, colour of paint, and the shape of a tea caddy. About twenty-five years ago the Arts and Crafts Movement had its origin in this country. It tried to teach us the beauty of simplicity and also the beauty of things made by hand. Alas! the mania for machine-made things had so deadened our mental vision that we would not give it a chance. An attempt is now being made to win back what we have lost, and to give to every home the chance of having its furniture and equipment in good taste. But twenty-five years have been lost, and with it the chance to be the leading and most artistic country in the world.

Where special cookery rooms are provided, it is found that the best position for the ranges is on one of the long walls. The demonstrator's table can stand in front of these and the other tables can be arranged in horseshoe form around. This arrangement seems to give the children the best opportunity of seeing all that is going on. The ranges can be according to taste and need; but in places where gas is provided, gas cookers as well as coal fires should find a place. The wall opposite the ranges is best provided with plenty of doors, so that the children can have the benefit of fresh air. The fittings should be simple but convenient, and the racks should be such that the pastry boards have air all round to prevent them becoming sour. Where water is heated from a back boiler, all the pipes, cylinders, etc., should be in full view of the children, so that the teacher may be able to explain what takes place (or ought to take place) once the fire is lighted. The question of the best kind of floor is often discussed. Tiles are apt to be cold to the feet, wood tends to gather grease and dirt, and asphalt never looks clean. Probably the best thing is thick cork lino laid on concrete, and then treated twice with oil as soon as laid. The oiling can be renewed from time to time, and this, with the fewness of the joints and absence of the chilliness to the feet, brings its own commendation. A room such as this can be used for laundry work without any further structural provision. A copper is desirable, but in the case of small classes, a large pot on the range will be sufficient. Sometimes a special heater for flat irons is provided, but an iron plate on the gas range will probably answer the same purpose. Any other requirement is, or should be, purely a matter of equipment.

Amongst the more enterprising of the old school boards, it was the custom to provide swimming **BATHS FOR SCHOLARS**. While this had no doubt much to commend it, it is really not part of education authorities' duties to provide them. Baths should be for the whole of the community, and in such case it is for municipal councils to erect them. The duty of an education authority is to arrange for instruction in swimming, and this would appear to be the attitude of the Board of Education

towards the matter at the present time. Baths for cleansing the students are desirable, especially in neighbourhoods where cleanliness is not too apparent. The most economical number to provide for is about eighteen or twenty, and several authorities are providing these baths. Hot and cold water is laid on to the showers, and care must be taken that the children cannot scald themselves.

Just as many education authorities regard it as no part of their duty to provide swimming baths, so also do they regard it as no part of their duty to provide *houses for teachers*. It is quite a reasonable view that when work is over, the teacher should be as any ordinary citizen. From the teacher's point of view, a walk to and fro must be found beneficial; and it must be a great boon when work is over to be able to live quite away. In towns when the housing schemes are completed there should be no difficulty; but in country districts, sparsely populated, a special residence may become a necessity. In no case should a residence be made to join up to a school in such a manner as to stop light and air and prevent future extension. In altering old schools with residences attached it is almost invariably found that the teacher's house is the chief obstacle to a satisfactory remodeling. While the Board's present building rules are more comprehensive, they are also more elastic; and the kind of house, size of rooms, etc., are not cut and dried as of yore. An architect has now the chance of providing a really domestic building, and not a conglomeration of cubical apartments. In domestic buildings, this country undoubtedly leads the way, and the Board is to be congratulated on leaving an open course. Instead of brick boundary walls, it is possible to have split wood, quick or holly fences, and thus make the surroundings such as they should be. Due care should be given to laying out the garden, so that the whole may be a model to all the countryside. One is glad to note that a bathroom is considered a necessity, and the wise architect will give plenty of cupboards and a good store.

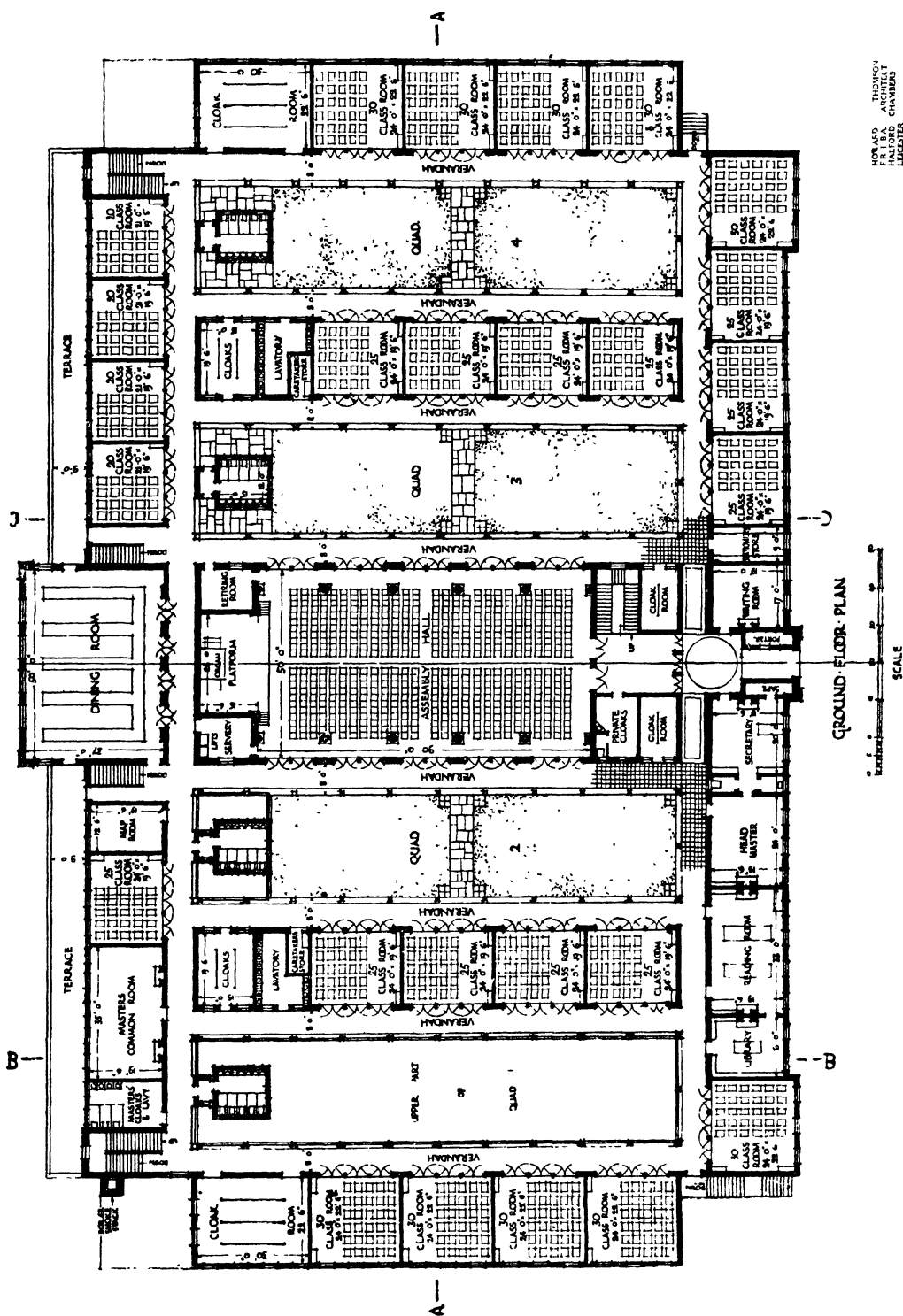
The FEEDING OF CHILDREN is a matter which in some districts may assume large proportions. In populous areas, probably the best and most economical method of dealing with the case is to have one large central establishment where everything can be cooked and prepared, and then distributed to the schools by means of specially constructed motor vans. If there are but few children to be fed at any particular school, there would seem no valid reason why the hall, if one be available, should not be used. If, however, large numbers require feeding, it is best to have a separate building, and there seems no reason why this should not take the form of a pavilion of timber or other light construction. One assumes, of course, that the caretaker will do his duty and keep these wooden erections free from vermin. In places where a single school requires attention, it will be found necessary to provide kitchen, pantry, and larder. It must not be too readily assumed that a cookery room or centre can be used for school feeding. Cookery and dining, strange as it may seem at first sight, do not go together in a school. The length of time required for cookery lessons and the amount of preparation for dining are nearly always sure to clash.

With SCHOOL GARDENS, it is desirable to lay down no hard-and-fast rules. The method of laying

out and working is best left, as a rule, to the instructor. In some cases, each boy has a plot, and all do the same thing at the same time and in the same way. The only difference, then, is a question of neatness. At North Somercotes the head master runs the school garden on the co-operative principle. Each child takes up a share and receives a proportion of the proceeds of the sales. Accounts are kept, and everything is done to make the thing as practical as possible. Whatever the system adopted, attention should not be riveted solely on growing cabbages. Flowers should receive much attention, and will possibly be best left to the girls in a mixed school. Rarely one sees attention given to making or paving footpaths between the beds, and yet all the difference is made to a garden by attention to the quaint paving of the paths and to surrounding the vegetable garden with a good herbaceous border. Why also should not there be a pond with fish, a rose pergola, a sundial, and such like? Why should school gardens be so bare and uninteresting?

Great advancement has been made in the matter of OPEN-AIR SCHOOLS by several of our larger authorities, but no one would claim that the last word has been said. With the advance that is being made in ordinary elementary schools, it seems probable that there will be little structural difference between these and open-air schools. The latter will, however, always require provision for feeding and a good supply of baths. One of the principal features of an open-air school is the resting shed, where the children pass no small amount of time in repose and in gathering strength. It is often thought that these sheds might be somewhat differently constituted, and the open-air wards of the military hospital at Leicester would seem to point a way. There is constant ventilation through the top of the building, and one of the sides has canvas shutters which can be let down or kept up. At nights and on windy days, when the shutters are lowered, a stream of air percolates through the building and, if this be not sufficient, the windows on the opposite side can also be opened. Air cannot become stagnant in any part of the building, and the windows on the far wall give a cheerfulness which is usually lacking in resting sheds.

Secondary Schools. In a secondary school, the chief difference from what we have been considering will be found to lie in the size of the classes, more space in cloakrooms, and more special apartments. In a secondary school for 250 boys, the following will be found necessary: Ten classrooms, cloak-rooms, two science laboratories (chemistry and physics), art room, manual room, hall, out-offices, head master's room, assistant masters' room, library, cycle shed, heating chamber, dining-room, and a gymnasium. If the school be mixed, or for girls, a cookery room must also be provided. In the latter case, the manual room may be omitted, but even among girls a manual room can be put to good use, and to more use than is at present the case. As regards the classrooms in secondary schools, there will be but little difference between these and those in elementary schools in the future, partly due to the exigencies of lighting and ventilation, and partly due to a desire for simplicity and reduction in cost. As, however, the number in each class is less than in elementary schools, and as the floor area is large, there is less likelihood of the walls being damaged, and the walls can thus receive



THOMSON
ARCHITECT
CHAMBERS

Wyggeston Grammar School, Leicester. Plan of the Ground Floor.

simple decorative treatment which will differentiate them from other schools. The note about cupboards being made to form part of the structure applies with even more force in a secondary school. Provided funds and other circumstances permit, a fireplace is a useful adjunct. A fire gives a feeling of cheerfulness on cold, damp days in winter; and, in the event of a classroom being required in the cool evening of a warm day, the occupants can be kept warm without the expense of starting the whole warming apparatus. A simple and inexpensive treatment for the walls is obtained by having a bold picture rail about 7 ft. 6 ins. from the floor and filling in below with wood styles and plaster panels. The plaster panels can be decorated, giving the requisite relief; while the part above the picture rail can be left white with the ceiling, and so help to diffuse the light.

CLOAKROOMS must have only one row of clothes, and each peg should have a split plate for the insertion of a card with the name of the student. Boot racks should be provided capable of holding one pair of boots and a pair of slippers. The tops of these racks should form seats for use while changing. The rails should be heated so that clothes may be dried. It is sometimes customary to provide a locker for each child with door and key, but this seems an unnecessary expense, provides extra places for the accumulation of dust, and necessitates more labour. Owing to the size of the large straw hats now used by school girls, it is best to have the hat pegs varying in projection. Two sizes will be sufficient, and the brim of a hat on a short projection will have plenty of room behind the brims of the hats on either side of it.

LAVATORY BASINS are best placed in a separate room adjoining the cloakroom, and should be provided with hot and cold water. The towels should hang so that they are in contact with a special hot-water coil, thus ensuring their being kept dry for use during each day. These lavatory rooms should be well ventilated and care taken that the waste pipes cannot become offensive.

THE CHEMICAL LABORATORY should be kept quite simple in its fittings. Too much money, as a rule, is spent on things that are quite unnecessary. The demonstrator's desk should be raised about a foot from the floor, and the bench provided with a sink and gas. All the gas to the other benches should be controlled from this bench, so that in case of accident the supply can be cut off by the science master. The students' benches should be simple. Drawers immediately under the top will be found useful. The tops should be of hardwood twice or thrice waxed, the wax worked in by hot irons. The framework supporting these benches should consist only of legs and rails, thus enabling the floors to be kept clean more easily. There should be no racks for bottles on the benches. Cupboards next the walls will be found neater, and each student can get down what he or she wants. Racks are dirty, give a laboratory an untidy appearance, and obstruct the view. One bench the whole length of the room and under the windows can be set apart for more advanced work. The other benches can be ranged the length of the room or across. Opinions vary on the merits of each. If placed lengthways, two should be without sinks, and a third one with sinks placed between the other two. If the benches are placed across the room, sinks are best quite at the ends on

brackets and slightly below the level of the bench tops. This leads to economy in the number of sinks and less slopping in work. The sink wastes should discharge into half-round pipes in the floor, with wooden doors above them which can be taken up for cleaning. Two or three fume cupboards will be required, and one should be placed quite near the demonstrator's table. An air flue must, of course, be provided to each, and there should be holes at top and bottom of each fume cupboard opening into the air flue, so that a flame can be inserted if necessary. There is no need for a special balance room, as a rule. A stone bench on stone corbels across one end of the room will usually be found sufficient. Fire extinguishers, which should be provided throughout the building, are specially needed in a laboratory. The PREPARATION ROOM should be immediately behind the demonstrator's bench, and should have a length of at least 20 ft., so that lantern slides and photographic enlargements can be made there. There should also be a sink and safe light provided. The shelves can be arranged to suit requirements. All the windows of the preparation room and the laboratory should be provided with blinds for the exclusion of daylight.

The equipment of a PHYSICS LABORATORY will be even simpler. Dark blinds will, of course, be required, and a demonstrator's desk. A long bench as before will be required, but in this case for experiments with light. Considerable divergence of views exists as to whether large tables or small should be provided, and probably the case would best be met by providing some of each. In this, as in everything else, common-sense plays an important part. The chief thing is to keep everything simple and provide only what is needed.

ART ROOMS should always face as nearly north as possible, and are best provided for lighting purposes with a special window curving over at the top, thus combining vertical and inclined lighting. A store should be provided for models, etc., and there should be two sinks—one at each end of the room, if possible. An art room should not be less than 22 ft. wide (preferably 25 ft.) to allow for groups and passage way all round. If the school be amid pleasant surroundings, it is a good thing to provide a flat roof over the art room, with a staircase up to it for outdoor sketching. Below the picture rail, the walls are best finished with a neutral French grey, so as not to clash with any colour work which may be in hand. In addition to the north light, there should be no other windows for admitting light. If a verandah be provided on the south side, doors and windows should open into this to provide a sufficiency of air, but not to admit any great amount of light.

THE MANUAL ROOM will be on similar lines to that in an elementary school, and the notes on pages 236-7 will apply here.

THE HALL, on the other hand, will be more important, and should be given a better finish. It is the centre for the school, where all meet and the corporate life is fully expressed. At one end, provision must be made for a platform, which can easily be converted into a stage for amateur theatricals, and two exits will be needed there. Footlights, etc., will also need consideration. At the opposite end a gallery is desirable; and if the school be fortunate enough to have an organ, this can be placed in the gallery with a special choir for speech days. If the hall be provided with verandahs with doors, etc., below and windows



By permission of the

Burnside Special School for Invalid Children, Glasgow

Glasgow Education Committee



By permission of

Bernard Street Supplementary School, Glasgow : Girls' Quadrangle

Glasgow Education Committee

PLATE XVI

above, there should be no difficulty in keeping the place properly ventilated at all times, even when quite full. For acoustic reasons, a circular ceiling is desirable, and this is further improved if the ends of the hall are cut off more or less after the manner of a quasi-apse. A clock on the front of the gallery, and therefore in full view of speakers, is desirable.

The OFFICES call for little further comment. Each closet should have a lift-up seat and separate artificial light also. The urinals should be separate and of glazed ware.

The HEAD MASTER'S ROOM should be so placed that easy access can be obtained to all parts of the building. It should also, of course, be near the main entrance. Ample cupboard accommodation is necessary, and if the school be large a telephone connection with each room in the building is desirable. In equipment, it will be something between an office and a domestic building. If it be a girls' school, special care will be required that the room may be dainty and in accord with feminine temperament, but without fussiness.

For the assistant teachers, the rooms should be arranged so that they conduce to work or rest as required. Each teacher should have a small cupboard; and in connection with all teachers' rooms, whether for the head or for the assistants, w.c., lavatory, and store accommodation in sufficiency must of necessity be provided. In a mistresses' room a couch, in addition to arm chairs, should always find a place. In mixed schools, it is desirable that the senior assistant mistress should have a separate room for interviews with girls and their mothers.

In the matter of LIBRARIES, different methods obtain; but one room should always be set apart for reference books. This room will require bookcases of varying heights and depths to suit all books. If possible, a table fixed to the wall with falling flaps should be provided, so that large atlases and other such books may be easily looked at without disturbing those reading at a table in the centre of the room. Additional bookcases can often, with advantage, be arranged in the hall.

CYCLE SHEDS should be arranged so that they are easy of access, and in day schools are best left quite open in front, provided that the roof projects sufficiently to prevent wet reaching the machines. The floor should fall to the front. The cycle stands need not be costly, and should be so arranged that they are alternately up and down a few inches. By this means the cycles can stand closer, as the handle-bars will not touch. In boarding schools it will be found necessary to enclose the cycle sheds, and also to heat them in some cases. In any case, the sheds should be so placed that theft cannot easily take place.

The HEATING CHAMBER in a secondary school should be as large as possible. The amount of heat required is considerable, and the heating engineer and caretaker should be given room enough to do their work properly. It will be found best, as a rule, with low-pressure hot water, to have two boilers instead of one, and to have them so arranged that they can be worked singly or coupled. In spring and autumn, one will usually be found sufficient. Easy access for fuel and for removal of ashes is, of course, essential. A third boiler will be required for hot water for the lavatory basins and for cleaning purposes.

There is no reason why the COOKERY ROOM

should vary in any considerable degree from that described for elementary schools. Much the same equipment will be required, and it goes without saying that the larder should be well ventilated and face north or east, preferably north (*see* p. 237).

A GYMNASIUM is best detached from the main building, but this is not always possible. It should have a verandah on each side, with doors the full length opening into these, so that the exercises may take place in full air. There is no reason why some of the apparatus should not be fixed in front of some of these doors. The windows above the verandahs will give the requisite light, and no windows of any kind should be provided at either end of the gymnasium. A gallery at one end is useful for musical drill, as a piano or other instruments can be placed there, leaving the floor free for the performers. The floor should be a boarded one, so as to give a certain amount of spring, but should not be less than 1½ ins. thick. The height of the room should be not less than 18 ft., 22 ft. if possible. As regards the fitting up, so much depends on needs and requirements, and on the personal taste of individuals, that each case should be taken on its merits. If one supplies only what is really necessary at first, money and inconvenience can often be saved; but, of course, the special needs and requirements of a gymnasium must be borne in mind when designing the structure.

A matter that has not received so much attention in the past as it deserves is the provision of CLIMATOLOGICAL STATIONS. No structures for these are necessary—merely apparatus. They stimulate interest in meteorological records and provide a reservoir of facts for use in the geography lessons. The site required must be well open to the south and west, should be enclosed with light fence, and provided with a Stevenson screen to contain the maximum and minimum thermometers and the wet and dry bulb hygrometer. A rain gauge should also be provided; and, to avoid the introduction of error due to eddying currents, this should be fixed on a flat site and not on a bank. There should also be a Solar radiation thermometer (black bulb) and a ground thermometer. All these instruments must in no case be nearer a building than the height of it. A weather vane is also requisite, not only for noting the direction of the wind, but also the movement of clouds. In addition to the above instruments, the daily height of the barometer should be recorded and its fluctuation compared with changes in the weather. A station containing the above instruments can be established in connection with the Meteorological Office, and is known as a climatological station of the third class. Instruments of excellent quality are supplied at a reduced rate in return for the trouble taken in securing accurate records and forwarding these periodically to the Office. Readings are taken at 9 a.m. at such a station. It has to be remembered that arrangements must be made for their continuance on Sundays and during school holidays.

DINING-ROOMS are most economical of space if planned to be entered at one end and with a central gangway. Plates, etc., can more easily be conveyed to and from the room, and are easily passed up and down each table. The scullery and pantry should adjoin the dining-room for reasons which are obvious. The kitchen should be large and, like the dining-room, well ventilated.

Boarding Schools. The Board's rules for boarding schools are so clear and full, that little remains to

be said. The educational part will, of course, be much the same as a secondary school. In the domestic part, it will probably be found best not to have more than twenty-five students in a house; but, in order to avoid a multiplicity of kitchens, two houses with a common kitchen and dining-room will probably be found best. An alternative would be a large kitchen block, quite detached, from which the food could be conveyed to each dining-room; but while such might be desired in orphanages supported by voluntary contributions and where strict economy is essential, it is hardly likely to find favour in boarding schools, especially as a kitchen and domestic offices might be made useful for instruction in housecraft.

Technical Schools. In urban districts the secondary schools are usually planned to meet the special needs of the district, and, such being the case, they adapt themselves easily for technical and evening schools. The chief point to bear in mind is that in evening work the time during which the students can work is very limited; and, in order to provide for all the students working at one time, it may be necessary to duplicate the day-provision of rooms set apart for art and science. Where technical institutes are built in large towns solely as such, it is to be feared that there are not many that can be referred to as models. As a rule, they are built on sites altogether too small, making the provision of the requisite amount of air and light next to impossible. No fixed rules can be laid down as to what should be provided in each institute. So much depends on the locality. The provision and equipment in a cotton district will be quite different from that in a metal locality. First must be settled the hygienic principles. After that, the needs of the neighbourhood must settle the kind of accommodation required, and the apparatus must determine the size and shape of each room.

Conclusion. These notes do not and are not intended to incorporate all the building rules of the Board of Education. Quite recently, the Board has revised its rules, and we may be proud that we have now a set of building regulations ahead of any in the world. These rules are available to all at a low cost. All that is attempted here is to amplify those rules and deal with the principal ways in which they can be applied. G. H. W.

BULGARIA, THE EDUCATIONAL SYSTEM OF.

—Education in Bulgaria is under the control of a director of secondary, special, and technical instruction; a director of elementary instruction; a chief inspector, a medical inspector, and six assistant-inspectors; a chief accountant and two assistant-accountants—all working under, and responsible to, the Minister of Education.

The Bulgarian schools are either national or private. The former are State-provided—departmental, district, or parochial; the private schools are supported by various religious communities. National schools are of four types: elementary, secondary, professional, and high schools.

Elementary Education. Elementary education is obligatory on children of both sexes, and lasts for four years. It comprises instruction in morals, catechism, Bulgarian, ancient Bulgarian, civics, national geography, natural history, arithmetic, drawing, singing, gymnastics, manual work (boys), and embroidery (girls).

Every village of more than fifty houses must have at least one elementary school. The children begin

to attend school at 6 years of age; and persistent irregularity of attendance, after the parent or guardian has been ineffectually warned, is notified by the teacher to the educational council, which has the power of inflicting a fine. The members of the council, also, are liable to a fine of from 10 to 100 francs if they neglect their duty. The proceeds go to the school funds.

An elementary teacher must be a Bulgarian subject, more than 17 years old, of good moral character, and free from physical defect. He must have been trained in a pedagogical school and have passed the State qualifying examination, which consists of written and oral tests in general education, and the principles and practice of teaching.

The elementary schools are maintained at the joint charge of the parishes and the State, the former supplying materials, furniture, service, libraries, etc., and being responsible for the upkeep of the buildings and gardens. The kingdom is divided into school departments, which are subdivided into school districts; each district is supervised by an assistant-inspector. The departmental inspectors are highly qualified university men who have distinguished themselves in pedagogical literature. Each department has an educational council, consisting of the prefect, who acts as chairman; the president of the district court; the mayor of the chief town in the department; the departmental inspector of schools; the director of a secondary or other high school; two secondary teachers (elected); and the head masters of the various elementary schools. This council, which meets once a month, administers the education code, investigates and decides disputes, provides school accommodation, enforces attendance, and revises disciplinary sentences passed on teachers. Its decisions are subject to the approval of the Minister. Every village has an education committee of three, and every town one of five members, to manage elementary education; the mayor presides, and the other members are elected by universal suffrage. They appoint teachers, raise funds for school maintenance, provide equipment and regulate the expenditure, and administer school property generally. They also take steps to secure regularity of attendance by the children.

Private schools are inspected by the Government inspectors and may be opened only with the permission of the Ministry of Education. Aliens are allowed to open schools of languages, professional schools, and schools of art.

Secondary Education. The secondary schools are called gymnasia. The course of instruction, till recently seven years, is now spread over eight years. The first three are spent in preparatory schools called pro-gymnasia, where the subjects are religious instruction, Bulgarian, French or German, history, geography, arithmetic, geometry, physics, chemistry, elementary anatomy, drawing, handwriting, singing, and gymnastics. The remaining five years are passed in the gymnasia, which have two sides, classical and modern: instruction on the classical side is chiefly literary, comprising Greek, Latin, French, and German, and sometimes English and Italian; mathematics predominates on the modern side. In both, Russian is obligatory. Besides these subjects, the full gymnasium programme contains religious instruction, Bulgarian, history, geography, physics, chemistry, algebra, geometry, trigonometry, descriptive geometry, mechanics, geology, civics, psychology, ethics, logic, drawing, singing, gymnastics. The school course ends with the "Examination for

Maturity," and the diploma is recognized by all the continental universities as a qualification for admission as a student.

Higher Education. The University of Sofia is the only university in Bulgaria. It contains three faculties: Historico-philological (16 professors), physico-mathematical (17 professors), and law (11 professors). The staff, appointed by the Ministry, consists of extraordinary and ordinary professors and lecturers, and there are also licensed privatdoctents. The academic council, presided over by the rector, who is elected annually by its members, administers the affairs of the university, its financial department being managed by the quaestor. The course of studies occupies eight semesters (four years), and terminates with the degree of Doctor (Ph.D.).

Other high schools are the following—

1. Engineering. One school; five years' course; State-supported. Entrance qualification is the pro-gymnasial course, as a minimum.

2. Painting. State-supported; five years' course. Now called the Academy of Fine Arts.

3. Agriculture. Three years' course; pro-gymnasial entrance qualification. These colleges chiefly prepare teachers for the Primary Agricultural Schools, of which there is a large number, supplementary to, and continuative of, the ordinary elementary schools, with a course of two years' duration.

4. Forestry. Four years' course.

5. Naval School at Varna, on the Black Sea. Five years' theory and practice, followed by two years' practical study. Pro-gymnasial entrance qualification.

6. Carpentry. Several, a few of them very modern, up-to-date, and efficient. Four years' course.

7. The Wine-making School at Plevna, which has greatly improved the industry throughout the country.

BULWER, JOHN.—A physician, who lived in the time of Charles I, and endeavoured to establish a system of teaching the deaf and dumb by hand-signs and by lip-reading. In his *Chirologia* (1644), he explains the use of signs, motions, and gestures; and further described his plan in *Chironomia*. He published another work in 1648 to show how those born deaf and dumb might "hear sounds with the eye" and also learn to use the vocal organs.

BUNYAN, JOHN (1628–1688).—Author of the *Pilgrim's Progress*, son of a brasier, born at Elstow, near Bedford, had only a little elementary education. In his sixteenth year he became a soldier in the Parliamentary Army (1644–1647). As Cervantes, also a soldier, was permeated with the old chivalric tradition and literature, Bunyan "lived" in the Puritan atmosphere and in the Bible, and wrote his *Pilgrim's Progress* (1678–1679) in Bible English. This work belongs to the class which represents life as a journey, and thus gives occasion for the introduction of real personages, however abstract their designation may be. The book was called by Hallam "the most perfect and complex of fairy tales," a description suggestive of the fact that the *Pilgrim's Progress* is a book for children as well as for grown-ups, and in almost every country, for it is stated that it has been translated into 108 different languages and dialects. Bunyan's sympathy with children—the sympathy which wishes to "improve the occasion" in all the direct experiences of life—was as didactic as that

of Isaac Watts (*q.v.*) in his *Divine and Moral Songs*. This was especially shown in Bunyan's *Book for Boys and Girls; or, Country Rhymes for Children*, 1686. This little-known book is addressed "to boys and girls of all sorts and degrees: from those of Age to Children on the Knees." It begins with the alphabet and simple spelling, then contains a list of Christian names of boys and of girls, then are given figures and numeral letters; the Ten Commandments and the Lord's Prayer and the Apostles' Creed are given in verse. But the main *motif* of the book is the emblematic nature of objects of sense-perception, such as an egg, the swallow, the bee, the candle, the cuckoo, the lark, bells, a frog, a penny loaf, a snail, a pair of spectacles. The following is a specimen of the treatment of "The boy dull at his book"—

"Some Boys have wit enough to shout
and play,
Who at their Books are Block-heads
day by day;
Some men are arch enough at any Vice,
But dunces in the way to Paradise."

F. W.

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BUREAU OF EDUCATION (United States).—A department established, in 1867, under a Commission of Education, for the purpose of collecting and publishing educational information. It issues annual reports, and sends out circulars of information devoted to education in the United States and in foreign countries. Bulletins have also been issued since 1906, containing useful matter on current topics.

BÜRGHERSCHULE.—Schools maintained by German municipal authorities to provide elementary education for the lower middle classes. They receive no State-aid, and the curriculum is adapted to local requirements.

BURGH SCHOOLS of Scotland are so called from having been originally managed by municipalities. The origin of the oldest was ecclesiastical, and can no longer be distinctly traced, but they continued to be founded, as occasion required, down to the nineteenth century. Schools of this character certainly existed by 1260. The transference from church to burgh control took place before the Reformation: it often involved a serious struggle, and it was effected through the readiness of the burgh to undertake the financial responsibilities involved. The management was transferred in 1872 from the burghs to the newly created school boards: the latter were in 1918 replaced by education authorities. The policy of the burghs had been so generous, that for twenty years the schools greatly regretted the change; more recently, they have recovered their position. At a time when the rural areas were starved and backward, the burgh schools were the main educational agency of the country, and rendered inestimable service. By stimulating the desire for higher studies, they contributed largely toward the foundation of native universities in the fifteenth century. They probably numbered eighty, but only eleven were in the Act of 1872 scheduled as purely secondary ("higher class"). The routine of a pre-Reformation

school is reprinted in the *Spalding Club Miscellany*, V. 399.

J. CLARKE.

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BURKE, EDMUND (1729-1797).—Was born at Dublin, and educated for the law, but devoted his life, from 1756, to literature and politics. For some years he was secretary to Parliamentary leaders, and in 1766 entered the Commons as Member for Wendover. He was a personal friend of Dr. Johnson, Sir Joshua Reynolds, and Garrick; and, in Parliament, a supporter of Fox till the French Revolution. From 1788 to 1795 he was the chief speaker in the impeachment of Warren Hastings. Burke's chief writings are *Philosophical Inquiry into the Origin of Our Ideas on the Sublime and the Beautiful* (1756), *Thoughts on the Present Discontents* (1770), *Reflections on the French Revolution* (1789), *Letters on a Regicide Peace* (1796).

BURNET, GILBERT (1643-1715).—Bishop of Salisbury; was born in Aberdeenshire; and educated at Marischal College, Aberdeen. He was minister of Saltoun (East Lothian), where, in 1668, he composed a short treatise, *Thoughts on Education*, addressed to a nobleman ("My Lord") conjectured to have been the Earl of Kincardine, and published posthumously in 1761. The principles are largely drawn from classical sources, especially Plutarch. The treatment of the pupil falls into four periods—childhood, boyhood, youth, early manhood—with a postscript upon travel. Throughout life, Burnet was actively interested in education. While at Saltoun he acted as tutor to Sir Robert Fletcher's sons; subsequently he was Professor of Divinity at Glasgow University. As bishop, he established a college for clergy at Salisbury; in 1698 he was selected as tutor to the Duke of Gloucester, heir presumptive to the throne. His educational views and methods are still of value for their robust sense combined with high moral force.

J. CLARKE.

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BURSAR.—A bursar is the member of a College or other institution who conducts its financial affairs, holding, as he does, its purse or burse. The other meaning of the word is the holder of a bursary (*vid.* BURSARY (2)). There are varieties of bursaries. Thus, at the University of Manchester, there are certain industrial bursaries aiding students of Science for a period of three years to take up practical engineering, chemistry or other industrial work. Candidates must not be above the age of 25 years. The value of such a bursary may equal but not exceed £150 a year. Much more commonly a bursar is a boy or girl between the ages of 16 and 18 years who has made a declaration of his (her) *bona fide* intention to become a teacher in a public elementary school, and who is actually a pupil at a recognized secondary school, but needs financial assistance in order to be able to complete the secondary school course. It is usually required that a candidate for recognition as a bursar shall have been receiving continuous instruction in an efficient secondary school for the three years

immediately before the period of recognition, which period is strictly limited to one year. The financial assistance usually takes two forms, viz., the remission of the secondary school fees, and the payment of a maintenance grant.

During the year of bursarship, the holder is required to pass an examination qualifying for entrance into a training college, or at least to pass in all but one or two of the necessary subjects. Should a bursar not satisfy this condition, he (she) would cease to be recognized as a member of the teaching profession; but on passing such an examination later, he (she) would be able to continue with the ordinary course of training as from the end of the bursar stage.

At the end of the bursar year, it is usual, and, for those who intend to spend only two years in a training college, it is considered highly advisable, to spend a year as a student teacher before entering college.

One year's training at least, either as a student teacher, or as a training college student, is usually necessary before an ex-bursar can be recognized as an uncertificated teacher.

BURSARY.—(1) In one sense the word denotes the office in which a bursar (*q.v.*) conducts his business. (2) In another sense it means a scholarship or exhibition, usually not large. The term is derived from the exchequer or purse (*bursa*) from which grants were early made to poor scholars in Scotland. The system has been largely extended. Hundreds are attached to the Scottish universities, thousands to the schools. The amounts vary from £2 up to £35 or £40, tenable for one or more years. The accepted mode of award is competitive, but many are bestowed by patronage—an undesirable method.

BURSCHENSCHAFT.—An organization in German universities established to promote Christian life and national patriotism among the students. The first was formed in 1815 at Jena, and the movement spread rapidly. The Burschenschaften put an end to much loose and luxurious life among university students, and to their practice of duelling.

BURTON, ROBERT (1577-1639).—Student of Christ Church, Oxford (1599), where he lived for forty years, and made a valuable collection of books, which he left to the Bodleian Library. Among many works, his best known is his *Anatomy of Melancholy* (1631), elaborated, analysed, and tabulated, of which he says: "I writ of melancholy, by being busie to avoid melancholy, to comfort one sorrow with another."

BURT'S TESTS.—(See TESTS.)

BUSBY, RICHARD.—Was born at Lutton, in Lincolnshire, in 1606. His parents, of whom little is known, were probably poor, as it is recorded that he owed his education to the kindness of wealthy patrons, and to donations from the churchwardens of St. Margaret's, Westminster. His parents came to reside in Westminster soon after his birth, and he became a scholar at Westminster School, where he was elected to a studentship at Christ Church, Oxford (1624). After a successful career at the University, he became a tutor at Christ Church, and was notable for his Latin and Greek, and more especially for oratory. He entered the Church in 1638, and was provisionally appointed head master of Westminster School (*q.v.*). In 1639 he was

stripped of his spiritual dignities for calling Laud "the little Urchin," and was compelled to undergo the pillory in Dean's Yard before his own school. In 1640 he was definitely appointed head master of the school, with a yearly salary of £20 and the sum of 20 marks in lieu of diet.

The Westminster Charter. The House of Commons during the years 1642-1649 made many enactments relating to the government of the school, appointing a committee of management in 1645, and passing an Act in 1649 for the continuance and maintenance of the school under a charter of incorporation. Busby was deprived of his ecclesiastical preferments, but allowed to remain head master, owing probably to his reputation as a schoolmaster. He probably took the Covenant when the order to do so was issued in 1644 to all persons connected with the "Collegiate Church at Westminster." But he and his school remained loyal to Church and King, who was publicly prayed for in the school on the day of his execution. He succeeded in retaining his post until the Restoration, when his services to the Royalist cause were promptly recognized, and he was made Prebendary of Westminster and Wells, and Treasurer of Westminster Abbey and Wells Cathedral. Oxford conferred on him the degree of D.D., and at the coronation of Charles II he carried the ampulla of the new regalia.

In 1672, Busby was appointed Archdeacon of Westminster, and in 1685 he took part in the coronation of James II. Although in his later years he suffered much from illness, and although he built a house to which he intended to retire in his old age, he remained master of Westminster till his death in 1695, at the age of nearly eighty-nine. He was buried in the Abbey, under the black-and-white marble pavement of the choir.

Scholastic "Successes." Busby was one of the greatest of English schoolmasters, and to him was due the extraordinary success of the school during four reigns and the Commonwealth. No master had so many successful scholars, and it was boasted at one time that sixteen of the bench of bishops had been educated by him, including Atterbury (1713) and Trelawney (1685). His pupils included John Dryden, John Locke, Christopher Wren, Matthew Prior, Charles Montagu, Lord Chancellor Jeffreys, Earl of Sunderland, Earl of Halifax, and Robert South.

Busby's severity was displayed in the excessive use of the birch; and Sir Roger de Coverley, before his monument in the Abbey, exclaimed: "Dr. Busby, a great man! he whipped my grandfather; a very great man!" But many of his pupils always spoke of him with great respect and admiration. Atterbury describes him as "a man to be revered very highly"; and one of his pupils wrote that he was conscientiously attentive to their religious training, teaching them not only by precept but by example.

His Generosity. Busby offered to found two Catechistical lectures—one in each university—with an endowment of £100 per annum, for instructing the undergraduates in the rudiments of the Christian religion; but as he wished to make the Bachelor's degree depend on the Catechist's examination, his offer was refused. He was liberal in his benefactions to university colleges and to Wells Cathedral, and made many gifts to poor parishes for education and the founding of libraries. He also repaired his school at his own expense, and built and fitted up its library. Busby left large legacies to be used for

educational purposes; and the Busby Trustees—thirteen in number and always "Old Westminsters"—now carry out their duties under the "Busby Trust" approved by the Charity Commissioners in 1887.

BUSINESS CORRESPONDENCE, THE TEACHING OF.—The writing of business letters is merely an application of the art of composition, and, in the elementary stages at least, it should be part of a course in "English."

Most of what the teacher of English says about sentence formation, sequence of tenses, concord, vocabulary, punctuation, etc., applies to the writing of business letters; but in this work a special atmosphere has to be created. Reference must be made to great commercial operations. Business bargains, involving immense sums of money must be spoken of; and the fact that many of these are made in writing, and that most of those made verbally on 'Change or elsewhere are confirmed in writing, must be effectively stated. Reference to the Sale of Goods Act must be made, because an important alternative in the important Section 4 states that a contract is not enforceable by action "unless some note or memorandum in writing of the contract be made and signed by the party to be charged or his agent in that behalf."

Business bargains are made, confirmed, and evidenced in business letters. In commerce, time is very precious; therefore, whatever instruction has been given about style, there must now be special insistence upon the points that business letters should be correct in statement, clear in meaning, concise in form, and courteous in expression. The teacher may venture a few illustrations of violations of these fundamentals, such being taken from the students' work.

The form of letters and the consistency of the complimentary terms should be dealt with early, paragraphing and punctuation receiving special notice. A simple transaction of a typical local industry should be taken, the correspondence starting with a request for particulars of specified goods or a price list, and the above formal points be taught by means of it. A real price list, or real particulars of goods, should be obtained by the teacher, who should put the first letter on the blackboard. Students should afterwards write similar letters. Various styles of reply may then be discussed—from the formal letter having the cliché "Trusting to be favoured," etc., to the smart letter calling attention to some special commodity, offering special inducements, etc. Students should now attempt suitable replies to the original request, and continue the correspondence until the transaction is completed. Other transactions should introduce bargaining, complaints, debit and credit notes, bills of exchange, etc., short lectures on the various forms being given and due regard being paid to progression. The teacher should always carry his main transactions through from beginning to end. He should give illustrations of flexibility in phrasing, and encourage his pupils to get away from the stereotyped, especially in letters soliciting business, where there is ample scope for effective appeal.

Small classes may be divided into two sections, which conduct operations as two firms, enclosing letters in envelopes and despatching them by special "postmen."

V. E. C.

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BUSINESS TRAINING.—In dealing with this subject, the first consideration is the purpose for which classes in Business Training are held. This purpose is the imparting of such knowledge as will enable the pupils (1) to perform their present duties satisfactorily; (2) to qualify for more responsible positions; (3) to take an intelligent interest in commercial matters. The subject is practical rather than theoretical, and in its various stages necessitates a consideration of the multitudinous matters which are incidental to the conducting of every business.

It is suggested that any one who undertakes Business Training should have gained his experience in the business world. This remark applies more particularly to the advanced sections, though in the elementary stage, also, the teacher with practical experience (other things being equal) will achieve better results than one whose knowledge is theoretical only.

The Pupils. These may be classified into three grades, but the classification might be considerably extended. First come those whose experience of business is either very short or has not commenced. In Grade 2 may be placed those whose business experience extends over a few years, and who are desirous of qualifying for higher posts. It may be assumed that such pupils have some knowledge of the more elementary business practices. Grade 3 consists of those who require information in the higher branches of commerce.

The Subject. The next point to consider is what ought to be taught in the various stages. Unfortunately, the teacher has not always freedom of choice of what he shall teach, his activities being circumscribed by the requirements of the examinations for which he has to prepare his pupils. The following courses are suggested—

ELEMENTARY CLASS. Indexing, the cross-reference, the vowel index, the card index, etc.; various methods of filing; the keeping of a Postage Book; the copying of letters, and the various processes of duplicating; addressing envelopes of different sizes and the proper way to fold letters; general postal matters; the filling up of bank paying-in slips, debit and credit notes, and similar documents; easy invoicing; writing simple letters; very elementary banking matters; short methods of calculation, particularly with reference to discounts and the working of practice sums; and common commercial terms.

INTERMEDIATE CLASS. Invoicing, both home and foreign trade; writing business letters from notes, and dealing generally with correspondence; making out and explaining account sales, accounts current, statements, contracts, etc., telegraphic work, and the use of codes; elementary banking; general knowledge of carriage and shipping routine; trade routes; up-to-date office appliances, interest calculations, etc.

ADVANCED CLASS. Advanced correspondence, drawing up reports, secretarial work; banking, including the use of bills of exchange, drawing of bills against shipments, discounting of bills, the hypothecation of shipping documents and financing generally; telegraphic codes and their compilation; consular invoices; Customs declarations; insurance

(fire and marine); up-to-date office appliances; bankruptcy; graphic statistics, etc. This course could be extended to any length.

The Lesson. In dealing with the elementary class, the limited experience of the pupils must ever be kept in mind; consequently, technical language must be used sparingly, each point being explained in the simplest language possible. One of the first difficulties experienced will probably be the lack of apparatus. It is much easier to *show* how a thing is done than to *tell* how it is done, and pupils understand much more readily if demonstrations are given. In many cases, however, no apparatus is provided; and we venture to suggest that education committees might, without being guilty of undue extravagance, provide commercial schools with some of the necessary appliances for demonstration. In the absence of such equipment, the teacher is left to his own resources and, if he is enthusiastic, the deficiency can generally be made up. As regards postal matters, it seems to be a waste of time to insist on the pupils learning by rote the rates of postage, minimum and maximum lengths allowed for parcels, and such like matters. A better plan is to ask each member of the class to purchase the postal guide issued by the postal authorities. The teacher can then show the pupils how to make use of this book; *i.e.*, show them where to find the information on different topics, explain anything that is obscure, and test their ability by asking questions on the matters contained therein. By using the book in the manner indicated, they are familiarizing themselves with a book which is used in every commercial office, they acquire without effort a knowledge of the more common facts, and they know where to look for the information which is less frequently required.

In teaching the correct way to address envelopes, to fill in paying-in slips, to make out debit and credit notes, etc., the teacher should provide the pupils with the actual forms and allow them to fill in these forms following the specimen shown on the blackboard. If this is impracticable, the teacher ought to be provided with a few specimens of each form, correctly filled in, and these should be handed round for inspection. In supervising the work of the class, the teacher should notice the spelling and punctuation, and should lose no opportunity of giving the class a little drill in spelling. Where it can be arranged, some time should be devoted to short methods of calculation. The remarks about specimen documents apply with greater force to the intermediate and advanced classes. It is a mistake for the teacher to define the use of a document without first explaining the circumstances which necessitate its use, and showing at least one copy.

In the intermediate stage, the course can be arranged in an interesting manner on the following lines; as soon as convenient after the beginning of the session (during which time revision of work previously done can be proceeded with) the teacher introduces a few typical orders, presumably received from customers at home and abroad. Using these as a basis, he can go through all the procedure necessary to the time the goods are paid for. This will include the recording of the particulars of the orders, the sending of purchase and sale notes to suppliers and customers respectively, the correspondence relating to the goods, as well as the correct methods of keeping the correspondence.

Then would follow matters relating to the receiving of the goods and payment for them; the despatching of the packages by rail and by steamer, with the routine connected with this procedure; the sending of telegrams, both inland and foreign; dealing with claims; and the obtaining of payment for the goods. The adoption of such a scheme brings under notice all the general matters connected with a merchant's business: they are considered in proper sequence, all the documents are introduced at the right time and it is a practical way of dealing with the subject. Another method is to divide the class into two sections, one section representing buyers and the other section representing sellers. Transactions take place between the two sections (under the supervision of the teacher) in a similar manner to that which obtains in actual business. The successful working of this scheme depends on the ability of the teacher to organize his class efficiently, and also on the regular attendance of the pupils.

Class Management. Friendly relations with the class having been established, the next consideration is how to present the lesson in an interesting manner. As a machine runs easier after it has been in motion for a short time, so the minds of the pupils are in a better state for receiving new information after they have been exercised for a little while. This leads to the suggestion that the first few minutes of each lesson should be devoted to revision, which can be accomplished either by a review of past lessons or by judicious questioning, preferably the latter method. The teacher should then, by a gradual transition, lead up to the new matter which is to form the subject of the lesson. This is particularly easy in a business training class, because the subjects dovetail into one another so easily. It may be mentioned that the matters should be dealt with in the order in which they occur in practice, so that the relationship of the various items may be shown. Another point to remember is, never to teach too much in one lesson and never to explain a new procedure without first showing the necessity for it. As the lesson proceeds, some of the pupils will probably begin to show signs of restlessness. This is a signal to the teacher to alter his methods. A few questions judiciously distributed may soon put this right and allow the teacher to resume. It may be, however, that the cause of the unrest is that the teacher is talking too much. Some teachers seem to think that in giving a lesson, they must do all the talking. This is a mistake, and such teachers would probably obtain better results if they allowed the pupils to do a little of the talking. From what has been stated, it seems that a judicious mixture of statement, illustration, and questioning is necessary, the discretion of the teacher determining the right amount of each to use. The questions referred to may be answered orally or in writing, the latter method being preferable if time permits. The writing of the answer adds variety to the lesson and impresses the matter more firmly on the minds of the pupils than in the case of oral answers. The duration of the lesson should allow the teacher sufficient time for recapitulation, the chief points being briefly reviewed.

Correlation with Book-keeping. In some classes, the teaching of Business Training is correlated with Book-keeping. The idea is undoubtedly a good one, provided the time allowed for the class is sufficient. It enables the teacher to carry a transaction to its destination instead of having to break off as soon

as the use of the financial books is involved. For instance, in dealing with purchases and sales, the teacher, after explaining the procedure and documents used in these transactions, would introduce the Purchases Book and Sales Book, explain the object of these books, and illustrate the method of entry therein. This would be followed by the posting of these entries to the Ledger accounts, and the opportunity would be taken to give the students some general ideas of personal accounts and purchases and sales accounts, and of their use in giving information regarding the financial position of buyer and seller. Similarly, after the various forms of remittances have been considered, the Cash Book would be explained and entries made involving discounts, the receipt and payment of accounts by cash and through the bank. The making out of debit notes and credit notes opens the way for an explanation of the Returns Book and the posting of the entries to the Ledger. By the time the student has passed through the first-year course, he has acquired a knowledge of book-keeping sufficient to enable him to deal with a series of simple transactions requiring the use of personal, noninal, and capital accounts, from which a Profit and Loss Account and Balance Sheet can be prepared. The foregoing remarks are applicable chiefly to the junior classes.

The lesson in the advanced classes generally takes more the form of a lecture, and all the teacher has to do is to present the lesson in as interesting a manner as possible, making free use of any documents that may be mentioned and illustrating his points with practical examples. Above all, he must be correct in his information, as, in these advanced classes, each member is something of an expert in one branch or another, and if the teacher makes a statement which is not in accord with practice, he is immediately challenged. Considerable discussion should be allowed. As a final word, it may be said that the teacher of advanced classes should be a diligent reader of the commercial and financial Press in order that he may keep in touch with the changes and improvements which are constantly taking place in these go-ahead times.

F. H.

BUSS, FRANCES MARY.—As one of the pioneers in the movement for the higher education of girls, Frances Mary Buss takes high rank. She founded the pioneer modern school, and for forty-five years moulded its traditions and presided over its fortunes. She was born on 16th August, 1827; opened the North London Collegiate School on 4th April, 1850; and the Camden School on 16th January, 1871; and died on 24th December, 1894. Miss Buss's influence in education, however, stretched far beyond the walls of these two schools now called by her name. All the educational problems of the day interested her profoundly. Special services were rendered by her (1) for the internal development of secondary education by the institution of the Head Mistresses' Association; (2) in counsel and support, by early supply of students (and otherwise) to the Training Colleges for Secondary School Teachers; (3) by similar services in regard to the University education of women. At one time, her pupils numbered nearly one-third of the total at Girton College; and the early lists of the University of London tell a similar tale.

Personality. It is difficult to describe adequately

the educational wisdom of Frances Mary Buss; she was always so much greater than anything she did and, by the influence of her personality, so much more powerful than anything she said. Her power of clear, vigorous thought was encompassed by such wealth of sympathetic intuition as made her judgments surpass her arguments in weight as much as her grasp of a problem outspanned her statement of it. Similarly, the educational ideal, as she apprehended it with her whole nature, was much more complex and massive than the same ideal as she envisaged it in thought. Thus she entirely escaped the danger of missing the solution of an individual problem by a set application of secondary principles. Each such problem appealed to her instinctively as unique, to be felt about in its concrete individuality as well as thought about till the appropriate solution appeared. One mark of this was the wise deliberateness which she showed in decision, as contrasted with her unflinching swiftness to act.

Once decision was taken, she acted immediately; and she never postponed decision beyond the moment when action was required. Moreover, she kept on acting—devising means to the end, if need be—till the thing was done. Of all her gifts, this executive ability is perhaps the one which she inspired most in the younger women serving under her. Promptness to act as soon as you decide became the custom wherever she was.

Her own character, instinct as it was with the qualities of leadership, was, in fact, her chief means to the development of theirs. In Frances Mary Buss were found combined the broad humanity that makes sympathetic contact with all sorts of people, the directness of conscience that gives certainty to character, the strong will that requires what it decides, and the tender sympathy that makes allowance for failure even while it continues to demand success. In herself she realized the full being and clear purpose of the "virtuous woman," in whom the heart of all her dependents "can safely trust." In her girls—of each in her measure—she expected the same womanly completeness, and, like producing like, they came to expect it also of themselves.

Formation of Character. No effective incident seemed to her merely a trifle. If a thing was to be done—well, it had to be done: its omission was a double neglect of duty, blameworthy because (1) it betokened failure of purpose and (2) it gave trouble as a breach of expectation. To her mind, these principles were as clear as the day in application to small things as well as great. Precision and vigilance in respect of small duties were part of her system for the training of character to self-controlled, practical efficiency.

Her conception of character was of the broadest: physical well-being, intellectual efficiency, all-round culture entered into it, together with moral idealism, spirituality, and vigorous will. Each girl was, to her, a whole—clearly imagined, but without subtle discriminations—in whom she saw the higher possibilities, and for whose deficiencies she had the mother's tenderness no less than the teacher's sympathy. This tender sympathy with weakness contributed, indeed, not a little to her victories over it. With her ready imagination and profound sense of personality as sacred, it was natural that she should feel for each small struggling germ of a human character the exceeding preciousness it so little realized for itself. Two things she never did.

She never remembered a child's sins against her after the particular naughtiness had passed, and she never gave a girl up as hopeless; if one way failed, then another must be found. Sometimes, when moral motives flag, quiet external discipline will bring them round. Sometimes the development of any intellectual interest will avail for a beginning.

Religious Faith. Behind and beyond all this lay a great religious faith—an invincible belief in the possibility of achieving righteous ends. This faith, as belief in the possible good character, was, in effect, the master-principle of education in her hands. And, its hold being even more on her heart than on her head, she wielded it with a skill not given to the mere theorist. "I ought, therefore I will"; "I will, therefore I can"—these were the lessons she taught her girls. When absorbed in wrestling with a difficult case, she seemed almost to believe that anybody could be induced to do anything. As a consequence, she produced wonderful results, though often at great cost to herself. She believed in every one, but she would let shifting purposes and slipshod work pass with no one. Thus she made what she would of many, their own powers being revealed to them as mirrored in her expectation. And this was the more possible to her, because she had a practical awareness of personal limitations, but was not thereby disturbed. Her mind dwelt on the good in them, her heart wrestled with them for it; she found it, showed it to them, and taught them how to make it master in the city of the soul.

S. BRYANT.

BUTLER, DR. SAMUEL (1774–1839).—Head master of Shrewsbury School, 1798–1836; Bishop of Lichfield and Coventry, 1836–1839; he came of yeoman stock at Kenilworth, was educated at Rugby and St. John's College (Cambridge), and was elected by his College to the headmastership of Shrewsbury School, when the school was at its lowest ebb with one pupil only. Dr. Butler awakened the public schools of England from the lethargy of the preceding century, which had provoked such bitter attacks on the old endowments. At Shrewsbury, Butler aroused a spirit of work and thoroughness resulting mainly from his own vigorous personality, watchful attention to individual progress, and careful tests by searching half-yearly examinations, and promotion strictly according to merit. Butler may be said to have inaugurated the era of modern school examinations, which have now become so burdensome, but which were then needed as a stimulus.

Dr. Kennedy, Butler's successor at Shrewsbury, describes the system which prevailed there during his school days under Dr. Butler. In a letter dated 5th May, 1887, Kennedy writes: "Homer was always one lesson a week. Some Greek play was always in hand. Demosthenes was a favourite author of his, and we did some Thucydides. . . . In Latin, Cicero, Virgil, and Horace were his favourite books—always to the fore." Kennedy continues: "History and geography were never neglected. . . . He was, of course, an excellent scholar, and no ordinary teacher; but his crowning merit was the establishment of an emulative system, in which talent and industry always gained their just recognition and reward in good examinations. This it was that made his school so successful and so great. Added to this, he always advised and recommended private reading."

In 1813, Butler published his *Modern and Antient Geography*.

Before the time of Dr. Arnold at Rugby, Butler had developed self-government and sense of responsibility in Shrewsbury School in entrusting various disciplinary powers to the praepostors. He also granted as much liberty as possible in order to encourage self-reliance and self-discipline among the boys. Dr. Butler kept in close touch with the Universities, especially Cambridge, and concerned himself with the cause of university reform in a practical direction. In 1822 he published, under the pseudonym "Eubulus," *Thoughts on the Present System of Academic Education in the University of Cambridge*, pointing out the numbers who obtained no intrinsic and practical advantage from their reading in mathematics. "What have they to show for an education of three years and a quarter?" Again: "How many Cambridge mathematicians distinguish themselves by bringing their mathematics to bear upon the useful arts?" He demanded a widening of the range of degree examinations, beginning with the establishment of a classical tripos. "A university is a society of students in all and every of the liberal arts and sciences."

The influence of Dr. Butler on the other great public schools of England is illustrated in observational visits to Shrewsbury, like that of Dr. Longley, the newly-appointed head master of Harrow; and in letters asking for advice, like that, in 1834, from the Rev. E. C. Hawtrey, newly-appointed head master of Eton; and in various tributes paid to him on the occasion of his resignation at Shrewsbury and upon his death.

Butler's correspondence with other heads about school reform shows little speculation as to abstract principles of teaching and educational ideals, but rather a practical and immediate need of adjustment to growing university demands. Nevertheless, Butler's school reforms, taken together with his views on university reforms, show a comprehensive grasp of a broader and saner educational system, with more direct bearing on actual life.

As regards the education of the poorer classes, Dr. Butler did not advocate anything beyond instruction in reading and writing. He gives his reasons in a charge delivered at Derby and Chesterfield in 1826, in his capacity as Archdeacon of Derby. His love of thoroughness made him distrust superficial knowledge acquired in a short school course—"the progress of all real knowledge is gradual." He distrusted multiplying helps to learning—"Mighty difficulties make mighty minds": memorable sayings at the dawn of a movement which, at the present day, lavishes scholarships and free tuition, and almost bribes the children of the poor into learning.

Butler was an outstanding personality. On his approaching resignation, Monk, Bishop of Gloucester, wrote to him: "There is nothing in scholastic history which can be fairly compared with your career except that of Busby"; and, after Butler's death, Dr. Robert Scott (Master of Balliol and, later, Dean of Rochester) wrote of him in the *Quarterly Review*, September, 1842: "... if the silent but most practical reformation which has been at work in our public schools for many years ever attracts the notice it deserves, then the time will come when men will take an interest in tracing the steps of the improvement; and they will hardly fail to give honour due to that scholar who

first set the example in remodelling our public education, and gave a stimulus which is now acting on almost all the public schools in the country."

A. WATSON.

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BUTLER, SAMUEL (1835–1902).—Grandson of Dr. Samuel Butler, of Shrewsbury; educated at Shrewsbury under Dr. Kennedy, and at St. John's College, Cambridge; was intended for the Church, but, being unable to accept the doctrines of the Church, declined to take Orders; and, in 1859, took up sheep-farming in New Zealand, also contributing to *The Press* of Christchurch (N.Z.). He made a success of his farm, sold his sheep-run in 1864, and returned to England, settling in Clifford's Inn and devoting himself to painting and literary work, with frequent journeys to Italy—reflected in *Alps and Sanctuaries* (a perfect holiday book), 1881.

In 1872 he published the satire *Erewhon*, which was translated into Dutch and German; *Evolution: Old and New*, published 1879; *Unconscious Memory*, 1880; and *The Deadlock in Darwinism* (in *The Universal Review*, and republished in *Essays on Life, Art, and Science*)—aimed at the "exposure and discomfiture of Charles Darwin and Wallace, and their followers." Butler could not accept Charles Darwin's theory of evolution.

In 1896 he published *The Life and Letters of Dr. Samuel Butler* (q.v.), his grandfather, head master of Shrewsbury School, "in so far as they illustrate the scholastic, religious, and social life of England from 1790–1840." The work brings out in great detail the inter-relations of the leading English head masters of Dr. Butler's generation and the general trend of the English public schools, and contains an enthusiastic appreciation of the tradition of wholeheartedness which was exemplified later in Thring of Uppingham. The biographer writes: "If I were asked what I flattered myself upon as being the pre-eminent virtues of Shrewsbury, I should say sincerity, downrightness, hatred of sham, love of work, and a strong sense of duty."

In his comments, direct and indirect, on contemporary education (i.e., on the educational system of the middle of the nineteenth century), the younger Butler is essentially a critic and iconoclast. He attacks with Swift-like satire the unpractical character of the whole system of public school and university education of his day, and attacks it from the inside. To him, the Academic invariably implies the pretentious, the futile, and the anti-individual. He had an instinctive dislike of official hall-marks and conventional standards. He advocated bold investigation of accepted systems; and his criticism has much in common with that of Herbert Spencer and Rousseau. On the other hand, he looked coldly upon current enthusiasm for Dr. Arnold, of Rugby; denied that he was the founder of the monitorial system, which he says was already established under Arnold's predecessor, Dr. James; and, moreover, denied that Arnold's influence affected the public schools generally.

The chief point about Butler's views was his insistence on the value of an early contact with the realities of life, and the educational advantage of an independence as contrasted with the sheltered

state of tutelage induced by prolonged residence at public school and university. Like Rousseau, he recognized the value of the earlier manliness and self-reliance of the peasant. At a time when the apprenticeship system had given place to compulsory universal elementary education, and the movement had been started for the postponement of the "leaving age," we find Butler vehemently advocating the educative value of early wage-earning and personal responsibility! His, to some extent, autobiographical novel, *The Way of All Flesh*, portrays the cramping influence of the over-supervised life of the youth of the upper middle class; and the satire of *Erewhon* in its sketch of "the Colleges of Unreason," and the study of the "hypothetical language," exposes the futility and remoteness of ordinary university education, and the waste of the freshest years of life spent "upon dead languages.

Butler's New Zealand experiences after his academic surroundings, probably shaped his educational theories. Like Rousseau, he protests against the didactic forcing of unsought knowledge upon ill-prepared minds: "In art, never try to find out anything, or try to learn anything, until the not knowing it has come to be a nuisance to you for some time. . . . Let knowledge importune you before you will hear it. Our schools and universities go on the precisely opposite system" (*Note-Books of Samuel Butler*).

The broad international character of Samuel Butler's sympathies and associations is indicated in the various public notices of his death published in London, Cambridge, New Zealand, Rome, Sicily, and North Italy (Varallo). A. WATSON.

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BYZANTINE LEARNING.—The Byzantine, Greek, or Eastern Empire of Rome, was founded by Theodosius the Great, and lasted from A.D. 330 to 1453. Its learning is shown chiefly in the literature, which is written in Greek. Byzantium (Constantinople) was founded by the Megarians in 667 B.C., and produced architects, historians (including Anna Comnena and Eusebius), rhetoricians, students of philosophy (including Proclus), and many eminent theologians and fathers of the Church (including Chrysostom and Cyril). The study of classical writers and the collection of manuscripts was actively carried on, and the fall of Constantinople in 1453 let loose a flood of learning which moved westward.

C

CAEN UNIVERSITY.—The first establishment of this university was due to the English. In 1431, the Duke of Bedford, as Regent of Normandy, established at Caen, in the name of Henry VI, a college which was intended to be a rival of the University of Paris. It was subsequently enlarged and sanctioned by Pope Eugenius IV. Upon the conquest of Normandy by the French, the university was dissolved (1450) with a view to the foundation of a new one by the French king. The old one was, however, re-established and replaced on its former footing in 1452. At the Revolution, the Caen University was closed; but it revived in the nineteenth century, when it became second only in importance in the French Empire to Paris and Strasburg. The university included a college or high school, schools of medicine, drawing, architecture, navigation, and of geometry and mechanics as applied to the arts. In 1894 the institution became established as a State university, with faculties of law, letters, and science. There is also a preparatory school of medicine, degrees not being granted. The present number of students is about seven hundred, of whom more than a half prepare for law degrees.

CAGLIARI UNIVERSITY (Sardinia).—Was founded, in 1596, by Philip of Spain, and, being sanctioned by a Papal Bull, was inaugurated in 1630. It was re-organized by King Charles Emanuel in 1764. Its faculties are in law, medicine, science, and engineering. The courses in law and science are for four years; in medicine, six years; and in engineering, three, with two years' preparatory courses in science. It was declared a university of

the second rank by the Italian Act of 1862, and raised by local contributions to the first rank. The students number about two hundred and fifty, of whom about a half study law.

CAIUS, JOHN (1510–1573).—A native of Norwich, who became famous there as a doctor of medicine. He was educated at Gonville Hall, Cambridge, and devoted his attention to the study of Greek and the writings of Erasmus. He visited Padua in 1539, where he lectured on Aristotle, and also studied medicine. After an extended tour through Italy, France, and Germany—during which he became acquainted with many of the most eminent scholars of the age—he returned to England in 1544 and lectured on anatomy and surgery, and also wrote treatises on medical subjects. In 1557 he re-founded Gonville Hall; and, thenceforward, the College became known as Gonville and Caius College, with Dr. Caius as its first master. His supposed leanings towards Roman Catholicism caused many difficulties between him and the Fellows of the College, and many accusations were brought against him. In 1572, when England was stirred by the massacre of St. Bartholomew, it was discovered that Caius had a collection of Romish ornaments and vestments. These were seized and publicly burnt in the College court. His life was shortened by persecution, and he died only a few months later.

CALCULATING MACHINES.—The derivation of the word *calculate* from the Latin for "a small stone," reminds us that mechanical contrivances for performing arithmetical operations date from

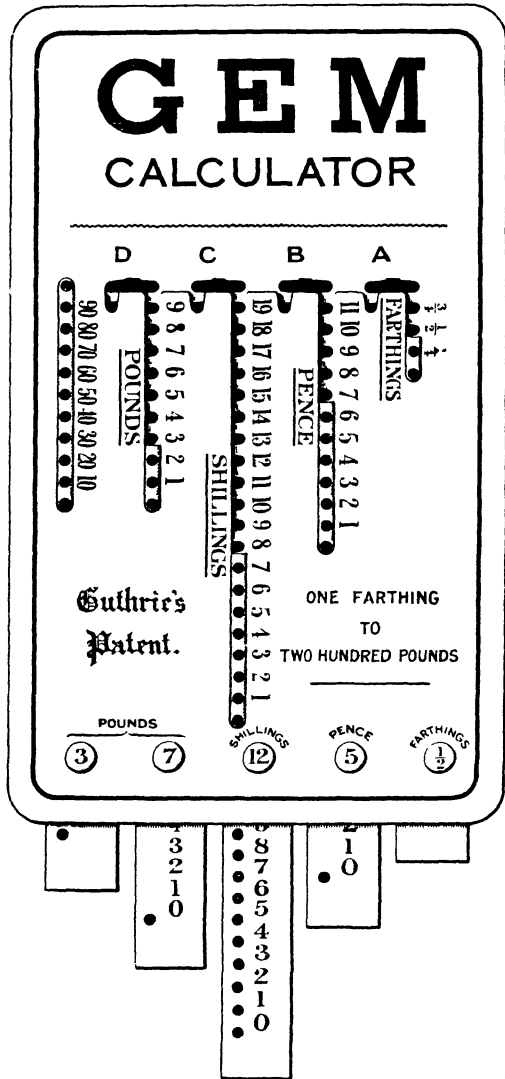
the earliest times. It was an easy and obvious improvement to replace pebbles on a board by beads strung on wires, and the *abacus* (*q.v.*), thus formed, is still used extensively in Eastern countries by small shopkeepers and tradesmen.

The "Gem" Calculator was at one time sold for a shilling, and could be carried in the pocket. Suppose it is wanted to add 4*l.* to £37 12*s.* 5½*d.*, a peg is inserted in the pence slot opposite 4, and the sliding scale beneath it is drawn down to the

transverse slot, instead of holes, but they are also coloured red.

The "Gem" apparently is now unobtainable; but a slight modification is described as the "British Calculator" ("Brical"), in which the sliding scales are replaced by circular discs, and "carrying" is effected automatically. From manipulation by a peg, it is a natural step to the substitution of mechanical means, such as levers or turning a handle; and thence to machines like the "Burrroughs' Adding Machine" operated by a keyboard containing nine rows of keys, by the depression of which the figures in the scales of units, tens, hundreds, and so on, may be increased by 1, 2, 3, 4, 5, 6, 7, 8, or 9 as required. To multiply 865 by 372, we should first strike the number 865 twice; then move one set of keys to the left and strike it seven times (*i.e.*, strike 7 times 8650); and then again move once to the left and strike 86500 three times, each time like striking a chord on a piano. or the operations may be performed in the reverse order.

Unfortunately, most British-made and many other adding machines will not work backwards; so that, if we want to subtract 123 from 2,718, the only plan is to add 10,000–123 (*i.e.*, 9,877), giving 12,595, and the 10,000 has now to be taken off by ignoring the initial unit and the result is 2,595. A digit *a* is, therefore, subtracted by adding 9 – *a*, except in the right-hand place, where 10 – *a* must be added. For this reason, both numbers *a* and 9 – *a* are printed on the keys. The process of division involves successive subtractions, and is somewhat complicated, but the following example of the division of 3,942 by 123 will probably enable a reader to make out the principle and its relation to ordinary division.



bottom, when the indicated number of pence changes from 5*d.* to 9*d.* But, if it is required to add 8*d.*, "carrying" is necessary, and the peg is now pushed up to the top of the slot, then across the transverse slot AB to the right, and then down the short opening B; thus carrying on one additional shilling. The portions of the sliding scales for which carrying is required not only have cogs facing towards the

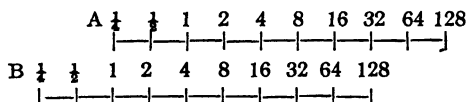
Calculating Machine.	Equivalent Operation.
3,942 + 98,770	10,000–123) 3,942 (32 + 300,000 – 3,690
102,712 + 98,770	300,000 + 252 1st stage + 20,000 – 246
201,482 + 98,770	320,000 + 6
300,252 1st stage + 9,877	
310,129 + 9,877	
320,006	

It will be seen that the figures carried in the successive complementary additions make up the quotient 32 and appear on the scale to the left of those representing the remainder. The complimentary additions have to stop when each give a number in the "remainder" figures which is less than the actual divisor.

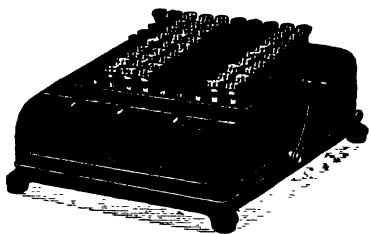
In the more elaborate machines used in mathematical work, the processes of multiplication and division are further facilitated by devices which enable the repeated additions of the same number to be performed by merely moving a handle the requisite number of times, and even this is now

done by electricity. Many of the more perfect types, such as the "Brunsviga" and "Mercedes Euklid," are German inventions, and only comparatively few are entirely British. In multiplying or dividing pounds, shillings, and pence by large numbers, tables for decimalizing money have to be used before and after operating.

The Slide Rule. An entirely different principle is involved in the Slide Rule, which is based on the proper fundamental definition of logarithms, according to which the logarithm of a product is equal to the sum of the logarithms of its factors. The annexed diagram illustrates the simplest form as used in calculating photographic exposures.



To multiply any number in scale A by one in scale B, say, 4, we place the 4 of scale B under



Burroughs' Calculating Machine.

unity in scale A; then each number in scale B is 4 times the number above it in scale A (e.g., $4 \times 32 = 128$).

If the intermediate spaces on the two scales be filled up with numbers between 1 and 2, 2 and 4, 4 and 8, and so on, we shall have a slide rule capable of performing multiplications and divisions to a degree of accuracy corresponding to the fineness of the graduations. To find a number d which is the fourth proportional to a , b , and c , we place b of scale B under a of scale A; then d will be on scale B under c in scale A. As the graduations are not equidistant, the working cannot be accelerated by mechanical accessories and "carrying" is impossible. But a scale 40 ft. long can be packed in a short compass by coiling it spirally round a cylinder and this form is largely used by engineers.

Inventors. Blaise Pascal (1623–1662), at the early age of 19, invented a remarkable machine for performing arithmetical operations. A more efficient form, invented by Gottfried Wilhelm Leibnitz (1646–1716), embodied certain improvements which still form an important feature of some of the more elaborate German machines. But it was Charles Babbage (1791–1871) who invented the most perfect machine for performing automatically any sequence of arithmetical operations. Unfortunately, when the construction of the machine was well under way, the Government withdrew financial support, and the work was never completed.

G. H. B.

CALCULUS, BEGINNINGS OF (See ALGEBRA, TEACHING OF.)

CALENDAR.—A table of the days divided according to (1) the year, as the time of the earth's

revolution round the sun; and (2) the month, as the time of the moon's revolution round the earth. The calendar now used is derived from that of the ancient Romans, whose year at first contained ten months—March to December. January and February were afterwards added, and the year consisted of 355 days, which necessitated frequent additions by the pontiffs. Julius Caesar cleared away much confusion in 46 B.C. by introducing a year of 365 days, with an extra day every fourth year. This was the Julian Calendar.

In 1577, Pope Gregory XIII undertook the correction of the error which had resulted from the solar year not being exactly $365\frac{1}{4}$ days in length. By his Bull of 1st March, 1582, ten days were annulled; and 5th October became 15th October. The Gregorian Calendar was adopted by Catholic countries, but not by England until 1752, when an error of eleven days was corrected by omitting 3rd to 13th September inclusive. Russia, Greece, and states belonging to the Greek Church still retain the old style, and their dates are now thirteen days behind. In the Gregorian Calendar the last year of a century (1600, 1700, etc.) is not a leap year unless the number is a multiple of 400; in Russia, all such are leap years. Until 1752, the year had commenced on 25th March; and 1752 was the first year in England when New Year's Day was 1st January. Scotland took 1st January as New Year's Day in 1600.

The French Republic founded a new calendar in 1793 with twelve months of thirty days each, and five festival days at the end, with new names for the months, and the first year from 22nd September, 1792, to be called the year 1; but Napoleon restored the Gregorian Calendar on 1st January, 1806.

CALEPINO, AMBROISE (1435–1511).—Italian lexicographer; born at Bergamo; entered the Augustinian Order, and devoted his whole life to the compilation of a *Dictionarium*, which appeared for the first time at Reggio in 1502. During the sixteenth century it was the dictionary commonly used in the learned world, and editions multiplied with great rapidity. The Aldus family reprinted it eighteen times, and numerous additions were made to it. To the Latin of the original were added words in Italian, Greek, German, etc.; and the edition published at Basel (1590–1627) was in eleven languages, including Hungarian and Polish. Calepino was deeply learned in Greek and Hebrew, and his work was a monument of his zeal and profound knowledge.

CALIPERS, CHEST.—An instrument resembling a pair of compasses with curved legs, used for measuring the diameter of the chest from back to front.

CALIPHS, EDUCATION UNDER THE.—(See MOHAMMEDAN EDUCATION.)

CALISTHENICS AND THE PHYSICAL TRAINING OF GIRLS.—The ancient civilization of Greece and Rome regarded the ego as a whole, and, considering the mental and the physical development inseparable, included the training of the body in general education. Of the actual methods, we know little. In Sparta, it seems, the girls were physically trained with the boys. Athletic contests were regarded as religious festivals, and the victors considered qualified for the highest services to their

country. During the Middle Ages, human development was retarded by the total disregard of education, which reappeared merely as the Revival of Learning. The body, being considered a curse, was not only neglected, but repressed and degraded. Such concessions as it received were given merely to avert its rebellion. To this day, education has not completely recovered from this tradition. It did, however, slowly turn from the acquirement of information in special subjects towards the old ideal of training the capacity inherent in the individual; and the child's mental, moral, and physical self were to be developed and fitted for further effort. Later still, science stepped in to corroborate the empirical knowledge of the Ancients, and physical training was recognized as an integral part of education. Hitherto it had seemed surprising to no one that the development of the child's mind should be entrusted to the teacher, that of its body to no one—until, that is to say, it was in a state of disease, when its care became the business of another profession. Between the two was no bridge of communication. It is here the teacher of physical training stepped in: to study the body in a state of health, to preserve that health, and to guide the body in its critical years of growth to the development of its maximum powers. In the mid-Victorian era, secondary and university education was confined to men and boys, and still suffered from the traditional narrowness of aim. The institution of secondary schools for girls coincided with the re-discovery of broader principles of education. That is how it comes about that in girls' schools, unhampered, as they are, by the weight of precedent, physical training is placed on a more scientific basis than in boys' schools.

Ling and the Swedish System. Over a hundred years ago, Ling postulated for the whole world the principles of physical training. He divided systematic training into five groups: (1) educational; (2) aesthetic; (3) recreational; (4) medical or remedial; (5) military. The last two groups achieved specific purposes. The first two were broadly educational, and aimed at the complete and harmonious development of the physical entity. Their provinces were not strictly circumscribed, but overlapping. Under the head of educational were gymnastics or calisthenics proper; under that of aesthetic, dancing and all rhythmic movement to music; under that of recreational, games and sports. In each case, the apparent object (that of climbing a rope, say; of experiencing aesthetic pleasure; of catching a ball) is only a secondary one, the chief object always being the harmonious physical development of the child, a development not only anatomical, but physiological. No system of physical training is complete without all the three groups. Of these, gymnastics or calisthenics is the most strongly corrective and shaping influence, especially necessary under the existing modern conditions, which are peculiarly bad for healthy physical development. Gymnastics tend the most directly to the production and the maintenance of health. Health is the perfect working of all the organs of the body. Hence, a teacher of calisthenics must have a knowledge of: (1) the normal working of the bodily organs—in order to aim at the right effect; (2) certain abnormalities—in order to prevent or to correct them; (3) the structure of the body; (4) the effect of every movement upon the working of the organs—in order to produce the required effect.

Then movements are grouped, and applied to the child in a scientific manner, in order to get the maximum desired effect in the minimum of time. Thus, a trained teacher is aware of the effect of the smallest movement on the child's body, even the turning of a hand, and gives it with the intention of producing just that effect. Exercises are grouped according to their result on the respiratory, circulatory, and digestive organs; and are applied with a view to their effect on the nervous and the muscular systems. In each lesson the full sum of effects must be reached. The various movements are graduated according to the physical and the mental capacity of the pupil: and these vary with her age, her habitual and her preceding occupation, her diet and many other conditions, each of which calls for different treatment. Thus, a lesson for infants, for secondary school girls of thirteen, and for factory girls of twenty will be conducted so differently as to the casual observer to appear to have very little in common; but, in reality, all have the same basis. Again, the sequence of lessons is minutely graduated so as always to follow up the capacity and increase the effect. All this has been systematized in what is now called—because it originated in Sweden—the Swedish system of gymnastics. What Newton did for physics, Linnaeus for botany, and Darwin for biology, Ling did for physical training; he discovered the underlying principle, and it is the scientific basis of the Swedish system that justifies its not being regarded on an equality with a dozen others, and its adoption in our public and secondary girls' schools, in the elementary schools, and in the Army and the Navy training. Since Ling's day, however, it has received innumerable additions and emendations. Ling himself invented some and collected other movements from many nationalities and from most pursuits in life, and this process is still going on, until it may be said that the Swedish system is a synthesis of parts of many systems, not gathered by chance, however, but collected under the root principle. A modern teacher of calisthenics, therefore, differs in principle from the old-fashioned empirical teacher. The latter taught movements solely for their *objective*, the former for their *subjective* value (*i.e.*, always for their physiological or psychological effect on the pupil). Hence it follows that the modern teacher requires an elaborate and scientific training lasting not less than two years (it is about to be extended to three), and no little degree of mental capacity.

Other Systems.—Much confusion has been brought about in the lay mind by the supposed rivalry of various systems of physical training. In fact, there is no such rivalry, for they either have different aims (*i.e.*, they are not gymnastics proper, and come under one of the other heads of Ling's classification), or they are not systems at all, but casual conglomerations of unsystematized exercises; or, again, they have too narrow a range and are but parts of a possible system. Thus the Dalcroze System of Eurythmics (*q.v.*) seeks to produce no definite physiological effect (except on the nervous system), but to train the aesthetic sense and the sense of rhythm. Hence it is not antagonistic to the Swedish system, but complementary. Jiu-jitsu is training for a specific purpose, that of self-defence; but is incidentally useful physiologically, and may well be taught in addition to the usual Swedish exercises. The German system is a survival of the old Army training, and is left in a few schools, generally where

the physical instruction is still in the hands of sergeants, janitors, or untrained women. It has no scientific basis, and its exercises are invented to suit certain apparatus—as parallel bars, high bar, etc.—instead of suiting the human body. It fails, therefore, physiologically, and also tends to local over-development—for instance, of the shoulder muscles. The so-called English system is a mixture of the German and some arm exercises done with wands, Indian clubs, or dumb-bells. As training, it is worthless, having, again, no guiding principle, and it over-develops the arm and the shoulder muscles. There are several individualist systems. Of these, Muller's is based on sound principles. Mrs. William Archer's relaxation exercises and the system of self-expression are too narrow in their scope for complete physical training, but may with great advantage be included in the usual lesson. There are several much advertised systems which fail, and may even be injurious, by reason of their total lack of scientific basis.

Physical Training in English Schools. Unfortunately, the principles of physical training are as yet so little understood by the general public in England, that we get nothing like the possible result—through false economy in time and money. In elementary schools for girls, not only is physical training reduced to one group—that of calisthenics proper, but even that is docked of its most effective part—the apparatus exercises. This is partly from want of funds for the construction of apparatus, partly as a safeguard—since none of the teaching is done by experts. Hence the training is far from satisfactory, although exceptional teachers get surprisingly good results even under these conditions. In Sweden and Denmark the elementary schools have fully-equipped gymnasias, and the teaching is done by the specially trained. The time allotted to the subject is thirty to forty minutes *daily*. In secondary and high schools for girls in England, outdoor games such as hockey, net-ball, tennis, and cricket are included in the training; but the time given to them is very insufficient—generally about a couple of hours a week. The physique of the town-bred, middle-class girl is often so poor, and her curriculum so overcrowded, that hockey and cricket are sometimes found to be too strenuous. Net-ball and short games of tennis are then the most suitable. Calisthenics are rather better placed. The schools always have a gymnasium with apparatus, and an expert to teach. The time given to the subject, however, is still ludicrously inadequate, being generally about an hour a week. In the large private and public schools (mainly boarding schools) for girls, physical training is on a much more satisfactory basis. Games as hockey, lacrosse, net-ball, tennis, or cricket are played *daily*. Swimming is sometimes part of the curriculum. Dancing is nearly always taught, and gymnastics are given several times a week—sometimes *daily*. The teaching is always in the hands of experts, some schools having as many as five physical trainers on the staff.

In conclusion, the ideal conditions of physical training for girls are tabulated—

1. A staff of experts working under a woman medical officer, who examines the girls every six months.
2. A fully-equipped gymnasium.
3. A special gymnastic dress.
4. A lesson of thirty minutes *daily* for the normal girls.

5. Special exercises and massage given individually to those who are below the normal.

6. Forty-minute games out of doors, followed by a bath and change (or a walk for those below the normal).

7. At least thirty minutes out of doors, not playing a strenuous game.

8. One and a half to two hours dancing weekly.

9. Instruction in hygiene and physiology.

V. V.

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CALVIN.—Until recently, John Calvin's great and influential services to education were, in competent circles, almost ignored. In Calvin, it must not be forgotten that the humanist preceded the theologian. During his youth, the future Reformer of Geneva studied law and languages at Orleans, Bourges, and Paris. His first work was a commentary on Seneca's *de Clementia* (1532), in which he showed his desire to tread in the steps of Reuchlin and Erasmus. His ambition was then to win a place in the triumphant procession of the Humanists.

The Académie and the Collège de Genève. The first reform which attracted Calvin was that of public schools. He was a friend of Gouvea, Sturmius, and Baduel, who afterwards organized successively the new "Collège de Guyenne" at Bordeaux (1534), the Gymnasium of Strasbourg (1538), and the "Université des Arts et Collège" of Nîmes (1540). When he had the opportunity of founding a school at Geneva, he drew up the *Leges Academiae Genevensis* (1559), as Melancthon had drawn the *Leges Academiae* of Wittenberg (1545). Luther's friend was called *Praeceptor Germaniae*; Calvin certainly deserves some kindred title with reference to the French, Dutch, and Anglo-Saxon countries. Calvin's views on remodelling the Genevan school and placing it under the supervision of the Church, were first set forth in the Ecclesiastical Ordinance, which he submitted to the Council of the little Republic directly after his return from the Strasbourg exile (1541). However, it was only after a struggle of more than fifteen years that he obtained the authority and the means for making the creation which has been justly called the crown of his Genevan work.

L'Université et Collège (as it was sometimes styled) of Calvin, which is to be compared with the contemporary foundations of Sturmius and Baduel, was based on the strictly progressive and classical organization of studies, as opposed to scholastic pre-Erasman confusion. What would now be described as primary and secondary education was set up on the basis of ancient culture; but Greek had equal importance with Latin in the syllabus of the Gymnasium, called *Schola privata*. Each of the seven classes was under a Regent, and all were supervised by the Principal (*Ludimagister*). In the lowest class, pupils were taught to read in French and Latin; Greek was begun in the fourth class. In the second they were taught the elements of dialectics, and of logic in the first. The progress of scholars, ascertained by annual examinations (a novelty), was rewarded by public promotions

made in Spring in St. Peter's Church, which, being the only festival allowed by sumptuary laws, became the national Genevese celebration. *Sapiens atque eloquens pretas* was Sturmius' aim when founding the Gymnasium of Strasburg. Calvin had the same end in view, but he insisted more on the moral than on the intellectual side of education. His pupils were brought up under a stern religious discipline, each bound to become God's servant; consequently, the Church received exclusive control of the School, which was a prominent feature of the plan.

The higher section of the School—the *Schola publica*—in which professors delivered public lectures to audiences of qualified students, bore the special title of "l'Académie" by contrast with the preparatory section, called "Le Collège." Unity was a condition of the success of the new system. It was obtained by placing both sections under the same head—the Rector, a member of the Company of Pastors—elected by them; and by entrusting all examinations to the professors of Theology, Philosophy, and Arts. When classicism had won its cause, "l'Académie," without losing control over the "Collège," developed quite independently into an international university.

The Aims of Calvin and his Success. Calvin's object had been to give instruction, according to his views, to the city children, and training in theology to foreign students. "Send us wood," he wrote to his French correspondents, "and we will make arrows." Beza, his successor, who was the first rector, and might be called the second founder of the University of Geneva, obtained his sanction for courses in law and medicine; but this was not effected till after his death, which occurred only five years after the inauguration of 5th June, 1559. In point of attendance, however, he had the satisfaction of seeing his efforts rewarded by great success. At his death, some 1,500 were being taught or had matriculated as students. Among the latter, history includes Kaspar Olevianus, one of the authors of the *Heidelberg Catechism*; Philip de Marix, the Dutch patriot and statesman; Florent Chrestien, tutor of Henry IV; Thomas Bodley, of Oxford; and Franciscus Junius.

Calvin's school at Geneva was the first external manifestation of his triumph over his opponents, and, with its foundation, the small Protestant city began to grow in importance. (See GENEVA, THE UNIVERSITY OF.)

The Genevan Academy became at once international, as was Calvinism. This is testified to not only by the names of those who came from North and South to be professors or students, but by its powerful and wide influence, by the eagerness with which its bye-laws were copied, by its numerous European imitators. Among these—to mention only high schools—were all the Huguenot "Academies"; the Dutch Protestant Universities; the Presbyterian University Colleges of Scotland; and Heidelberg University, as re-organized under the Elector Frederic III and his son, John Casimir.

When celebrating the fourth centennial of Calvin in 1909, the Genevese inaugurated an international memorial. A monumental wall, opposite the University Hall, recalls the sixteenth and seventeenth century fortress of Calvinism. Statues of Calvin and his fellow-workers—Farel, Beza, and Knox—are in the centre; and on the *socle* of this central group is 1559. Next to it are to be read the titles of the two most influential works of

Calvin: his *Institutio Christianae Religionis* and the *Leges Academiae Genevensis*. C. BORGEAUD.

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CAMBODIA, EDUCATION IN.—(See FRENCH COLONIES, EDUCATION IN.)

CAMBRIDGE, THE UNIVERSITY OF.—The origin of the University of Cambridge, no more than that of Oxford, is to be sought in the sphere of myth and legend. If ever the legendary Cantaber existed he was certainly not the founder, neither was King Alfred, nor yet Sigebert of Wessex. Its history does not begin till the year 1209, when, the clerks at Oxford having fallen out with the townspeople, there was a migration of the former to Cambridge, and a school was founded there, or, conceivably, an already existing school was developed on a larger scale. Its parent, Oxford, had in like manner most probably been the result of a migration from the University of Paris about the year 1167 (see UNIVERSITIES, THE RISE OF); but, however that may be, it is now more or less allowed that migration from Oxford was the cause which led to the establishment of a *Studium* on the Cam.

Throughout the mediaeval period, Cambridge appears to have modelled herself mainly on Oxford, except for one original institution, the *Magister Glomeriae*, the Father of a Faculty of Grammar. Here, as at Oxford, the chancellor, the vice-chancellor, and the two proctors, representing, doubtless, the two "nations," the Northern and Southern, were, and, of course, still are, the highest officials. The fact that Cambridge was so near to the Cathedral City of Ely made it harder for her than for Oxford to secure complete independence from diocesan control. The latter was then not a cathedral city, but was in the diocese of Lincoln, and consequently remote from the seat of its bishop and the undue exercise of episcopal authority. The Oxford chancellor, though the official representative of the bishop, was himself one of the Masters in the Faculty of Arts, in quite early times was elected by them, and gradually became rather academic than diocesan in his outlook. At Cambridge it was not until the fifteenth century that the University emancipated itself from the Bishop of Ely's ecclesiastical jurisdiction.

In the reign of Henry III we find at Cambridge an organization closely resembling that of Oxford, with a chancellor, two proctors, and a corporation of masters. Throughout the greater part of the mediaeval period, the University was not the serious rival to her sister that she became after the Renaissance, when such famous teachers as Erasmus, Ascham, Fisher and Cheke appeared as leaders of

thought and learning. The rise of Cambridge was also stimulated by the patronage of kings and queens and high ecclesiastics, perhaps in consequence of the Lollardism which infected Oxford in the time of Wycliffe. This growing popularity is marked by the rapid founding of colleges in the fourteenth and the fifteenth centuries, culminating in Henry VI's magnificent foundation of King's College, which, if it had been completed as its founder intended, would have surpassed every other institution of the kind. As it is, the chapel is without a rival.

It is claimed by some that the Reformation movement in England had its beginning in Cambridge. Certainly the University provided many of its leaders, and was conspicuous for its sympathy with foreign reformers of the extreme type, and with returned Marian exiles who had broken away entirely from Catholic tradition. Later on, it was at Cambridge especially that Puritanism assumed a definite form, though some of the Cambridge men were among its ablest opponents. But, while Oxford was ardently royalist in the Civil War, Cambridge declared for the Parliament. The most interesting of Cambridge movements, because it was distinctively a Cambridge product, was the revival and development on modern lines of the Christian Platonism of the second and the third centuries. The exponents of Cambridge new Platonism, basing their opinions on the teaching of Descartes, endeavoured to reconcile religion and philosophy, maintaining that there are two guides to be followed, the light of reason or Creation, and the light of Scripture or Revelation. The movement is chiefly associated with Benjamin Whichcote, John Smith, and, pre-eminently, Henry More.

The seventeenth century was marked at Cambridge by the growth of the study of Natural Philosophy, with which the great names of Barrow and Newton are associated.

In the following century, the establishment of the Mathematical Tripos enormously stimulated the study of mathematics in its various branches, and secured for Cambridge its unchallenged supremacy in this department of knowledge. For a considerable time the effect was to depress the study of the classical languages and literatures, and to confer the University's highest awards and distinctions almost exclusively on the mathematicians. It was not until 1824 that the scholarly section of the University was able to obtain the concession of a Classical Tripos, and, even so, it had to wait until 1850 to get rid of the condition that candidates for this Tripos must have already taken a class in the Mathematical Tripos. Since then, the great name of Porson among earlier scholars has been followed by a galaxy of names distinguished in the world of scholarship.

Besides depressing classical learning, the excessive culture of mathematics had a curiously hardening effect on religious teaching. The emotional side of religion was ignored, and teachers like Paley strove to commend religious belief and practice by the aid of dry reason. It was natural, therefore, that there should be a reaction, and this came in the form of the Evangelical Revival of the early nineteenth century, which is associated with its Cambridge leader, Charles Simeon.

During the centuries we have passed under review, the University underwent many changes in its constitution, but not the greatest of all, the

one for which radical reformers patiently worked and sighed. It was not until 1871 that the religious tests in the University and its colleges were abolished, or practically abolished. Previously, membership of a college and admission to degrees were confined to Churchmen, or at least to men who outwardly conformed. A large proportion of those who graduated entered Holy Orders, and the University was, as the founders of many colleges intended that their foundations should be, a nursery to the Church. The abolition of tests has had by far the most powerful effect of all the University reforms. It has created an entirely different atmosphere, and brought into the life of the place "new men, strange faces, other minds."

Under these changed conditions we now see the University's activities extending in an infinite number of directions, corresponding to modern requirements and circumstances. Provision is made for the study of an immense variety of subjects, and the apparatus that these require is furnished on a scale that would have been unimaginable a few decades ago. Only the University's restricted resources set a limit to the possibilities of infinite extension, and State aid has become an inevitable necessity.

In order to widen the approaches to a degree, during the last half century the admission of non-collegiate students to the University has become an established practice. This, of course, is in reality a revival of what, in the earliest times, was the normal condition of things, for the collegiate system was only a late thirteenth century development. Previously, the students lived where they could, often in little groups in a hostel under a principal, who was one of themselves and was elected by them. The University Extension movement of our day is another effort to bring the higher teaching within the reach of those for whom residence at Cambridge is impossible, by means of lectures and examinations in populous centres. The Cambridge local examinations are also a stimulus to the higher education of young people. For a good many years now women have been allowed to offer themselves for honours in the triposes, in which many students of the women's colleges, Girton and Newnham, have greatly distinguished themselves. Hitherto, though they have obtained university honours, they have not been admitted to degrees, but the logical result of their being allowed to compete in the class lists, namely, their receiving the complete status of members of the university, is inevitable. It is held in some quarters that they should create for themselves elsewhere a university of their own, on lines definitely suited to feminine educational requirements, but at the present time the contention that women should be educated exactly as are men has the greater strength. Clearly we have arrived at a stage where this ancient institution, like certain others, is about to undergo radical transformation. It seems to be only in this way that they renew their life.

Cambridge University (see UNIVERSITIES, RISE OF), is a Corporation of Masters, the Faculty of Arts being the dominant power. The legislative body is known as the Senate, acting in congregation. This body elects the Head of the University, the Chancellor, choosing always some person of distinction and commanding influence, residing away from Cambridge. Most of his functions are

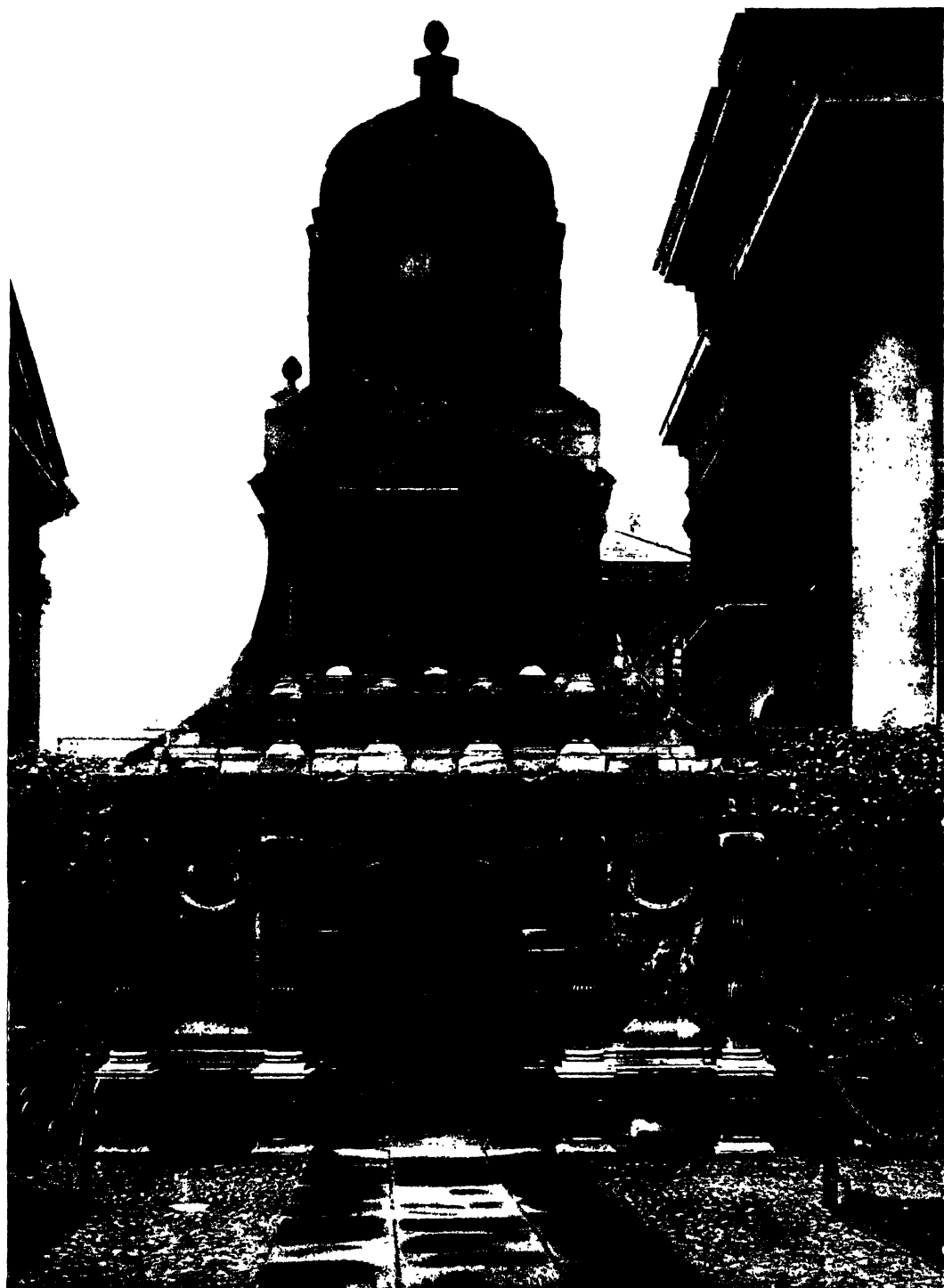


Photo by F. Frith & Co.

Cambridge, Caius College, Gate of Honour

performed by his appointed deputy, the Vice-Chancellor, who is always chosen from among the heads of colleges. This great officer is the acting resident head of the University. The Council of the Senate, consists of sixteen members elected by the resident part of the Senate, called the Electoral Roll. The most important officers are the Senior and the Junior Proctors, who are chosen by the colleges in rotation. Besides these officials, there are the Public Orator, whose duty it is to be the University spokesman on great ceremonial occasions; the Librarian; and the Registrar. The several faculties have each its own board. For the teaching of the many subjects of study there is a large staff of professors, readers and lecturers, acting under the General Board of Studies. Of the professorships, the oldest is the Lady Margaret Professorship of Divinity, founded by Henry VII's mother, Margaret Beaufort, Countess of Richmond and Derby. Five professorships, namely in divinity, law, physics, Hebrew and Greek, owe their origin to Henry VIII, and are distinguished by the prefix *Regius*. The various departments of university business are administered by syndicates.

Attainment of the degree of Master of Arts or Laws makes the holder a member of the Senate, within which the Council of the Senate, already mentioned, has a controlling power over legislation, as no grace can be submitted to the Senate without having first received the council's sanction. The members of the Senate, as a whole, whether resident or non-resident, are the governing body. A master's right to take part and to vote in the senate is retained so long as the master keeps his name on the University books. Until the last Electoral Reform Act, the power to elect parliamentary representatives for the University was vested in M.A. members of the Senate, but the power to vote can now, on payment of a small fee, be acquired and exercised by persons who have withdrawn their names from the books.

Originally all the teaching in Cambridge was given by the University, that is, by the persons on whom it conferred the *licentia docendi*. Even for a long time after the establishment of the college system, the students looked outside their colleges for instruction. It was due to the genius of William Wykeham, as shown in the statutes he framed for his new foundation of St Mary at Oxford, commonly known as New College, that the order of things was changed, and the tutors of the respective colleges became responsible for lectures. In this matter the lead given at Oxford was followed at Cambridge; and in both universities, by the eighteenth century, professors were too often inclined to consider the duties of their office as merely nominal. In our time the professorial system has recovered its former prestige, and a chair is now a real seat of authority and not a bare symbol of learning. It may be said that, in a general way, the older subjects—mathematics, classics and theology—are taught in the colleges, while the University makes provision for the teaching of the various branches of natural science especially, besides mathematics and classics.

Examinations. In order to qualify for the Bachelor's degree, the student must keep nine terms of residence, three a year for three years. Each term lasting for eight weeks, he resides at Cambridge only for twenty-four weeks annually. The first public test is the Previous Examination, held in his first term or during his first year. His

having passed an examination at school, or at some other institution, exempts him from the Previous, if the substituted examination is recognized by the University as equivalent. The next stage on the way to the Ordinary or Pass degree is either (1) the General Examination and a special Examination, or (2) two special examinations, or (3) the Preliminary Examination in science and a special examination. Part I of the General Examination includes classics, mechanics and simple trigonometry. In part II papers are set in the Acts of the Apostles, English history, elementary hydrostatics and heat, essay-writing, and (voluntary) a Shakespeare play or some portion of Milton's works. The Special Examination offers a choice of twenty subjects: agricultural science, botany, chemistry, classics, engineering, geography, geology, history, law, logic, mathematics, military subjects, modern languages, music, physics, physiology, political economy, psychology, theology, zoology.

As the curriculum is undergoing much revision, owing to post-war conditions and the influence of advanced educational ideas, it is undesirable to give the details of the examinations. The University Kalendar must be consulted for them from year to year.

Thus far the case of the ordinary examinee has been considered, the candidate for the Pass degree, or, as it is familiarly termed, the Poll, a name descriptive of *οι πολλοί*. For the Honours candidate there is the choice of thirteen *Triposes*, a name, by the way, which preserves the memory of a mediaeval institution. In the Middle Ages, gay young spirits delighted to burlesque solemnities, and both at Oxford and at Cambridge a certain licence was allowed by the authorities. At Oxford, a person called *Terrae Filius* was permitted to compose and recite scurrilous verses. At Cambridge, an "old bachelour"—old in name but not in years—conducted a mock examination, consisting of ridiculous disputations with those who offered themselves as candidates. The "old bachelour's" seat of authority was a three-legged stool—a tripod. When the custom died out, and the formal examination for mathematical honours was instituted, the university officials published the lists of the successful on the backs of the paper sheets which had been formerly used by the "old bachelour" and his associates. Hence the name *Tripolis*.

The *triposes* are appropriated to mathematics, classics, moral sciences, natural sciences, theology, law, history, Oriental languages, mediaeval and modern languages, mechanical science, economics, anthropology, English. Candidates are required to offer an extra subject with their Previous, and then proceed to study for their *tripos* or *triposes*, accordingly as they prefer (a) language and literature; (b) history, law, moral sciences, art; (c) mathematical and natural sciences. The Mathematical *Tripolis* is in two parts, as also is the classical. In the latter, the second part imposes on the pure scholarship of the first the requirement of proficiency in ancient history and philosophy. Moral sciences, natural sciences, and theology are likewise in two parts, but in these *triposes* a class obtained in the first part suffices for the degree. Law, history, Oriental languages, and economics *triposes* are in two parts, the first of which does not by itself suffice for a degree. The English *Tripolis* is in two sections, both of which must be passed. The Mechanical Sciences *Tripolis* is undivided, and must be passed

at one and the same time. The Modern and Mediaeval Languages Tripos is in two parts, and may also be taken in sections, but the regulations are too complicated to be further described here. The Anthropological Tripos is not complete in itself, but may be taken as the second part of some other tripos.

For some years past the old system of classification according to merit has been abolished in most of the triposes. The mathematical men in the first class, when there was only one final examination, were called wranglers, as those are still called who get into the first class of the second part. It was assumed that the examiners could, with unerring certainty, appraise the work of the man they named as Senior Wrangler, and so on down to the last man of the third class, or Junior Optimes, who acquired the unofficial title of Wooden Spoon. The men in the second class are styled Senior Optimes.

For the degree of *Master of Arts* no further examination is required. The Bachelor of three years' standing can, on payment of the necessary fees, proceed to the full degree of Master. Until he incepts in arts he remains *in statu pupillari*. The Master's degree gives him the licence to teach. In fact, he was formerly required to remain in residence for some time and to exercise his teaching office, after which he could teach or not, as he willed.

In addition to the Arts degree, the various faculties, divinity, law, letters, science, medicine, music, grant degrees leading to the doctorate. Usually there is only one inferior degree, the Bachelor's, but certain intermediate degrees, as Master of Laws, Master of Surgery, and Master of Music, are also conferred, but in surgery there is no doctorate.

THE COLLEGES. An account of the origin and the development of the College System will be found under OXFORD, UNIVERSITY OF (*q.v.*).

Peterhouse. Ten years after the founding of Merton, Hugh de Balsham, Bishop of Ely, founded the earliest of the Cambridge colleges—Peterhouse, as it is named. He avowedly took for the model of his statutes the Rule of Merton, and planted his little company of scholars in two hostels, at the south end of Cambridge, just beyond the Trumpington Gate. Dying in 1286, he bequeathed to them the sum of 300 marks, with which they should build a hall. With the two hostels, the hall and the kitchen the society remained contented for almost a century and a half, when they began to develop the buildings on the quadrangular plan, which was then becoming the mode. Until as late as 1628, they used the parish church of St. Mary the Less for worship, and then, greatly daring, built a chapel in the middle of the court instead of at the side. The innovation was, in this instance, distinctly a happy one. A long line of worthies has adorned this venerable college. Among great ecclesiastics were Cardinal Beaufort, Whitgift, Matthew Wren and John Cosin. In other departments of life and knowledge, mention should be made of Dr. John Jebb, Sir William Browne, the poet Gray, Henry Cavendish, and Lord Kelvin.

Clare College, the second in chronological order of the Cambridge colleges, was founded in 1326 by Richard de Badew as a "house of scholars," whom he settled in two messuages. At first, the institution was named University Hall, but the Lady Elizabeth Clare, ten years later, provided

new buildings and an endowment for the society, which thenceforward was styled Clare Hall. These buildings were in use for three centuries, and in 1636 the process of rebuilding the college on an enlarged scale began, and went on for 130 years. The chapel, the last structure to be rebuilt, was completed in 1769. With wonderful skill the successive workers blended the later Italian with the older Jacobean features, the Italian chapel seeming to harmonize completely with its surroundings. To anyone approaching the college by way of the extremely beautiful bridge the buildings present the appearance rather of a stately house or palace than of an academic institution.

Pembroke College owes its foundation in 1347 to Maria de Sancto Paulo, Countess of Pembroke. The institution was at first named the Hall of St. Mary de Valence, after the foundress's husband, Audamarie de Valence. Later, Henry VI took the college under his patronage, and other notable benefactors, as Bishops Lancelot Andrewes and Matthew Wren, followed suit. The latter's nephew, the great architect Christopher Wren, built the present chapel. The college is rich in great names: Edmund Spenser, Bishop Fox of Winchester, Bishop Lancelot Andrewes, the younger Pitt, the poet Gray (who emigrated here from Peterhouse), and others, too many to enumerate. What Queen Elizabeth thought of Pembroke was expressed in her exclamation: *O domus antiqua et religiosa*. Bidding farewell to his old college, Bishop Ridley affectionately described it as "mine own college, my care and my charge."

Trinity Hall. We have seen that, in the cases of Pembroke and Clare, the name Hall, which denotes the place of residence, has been superseded by the name college, which denotes the society. This college of the Holy Trinity, the earlier of the two under that invocation, retains unchanged its ancient title, while Henry VIII's great foundation is styled Trinity College. Founded by Bishop Bateman of Norwich in 1350, as a place for the study of Canon and Roman Law, Trinity Hall has ever since been a nurse of lawyers. Among the most famous was Sir Henry Maine, and in a different way the names of Henry Fawcett and Leslie Stephen shed lustre on the college. Among churchmen, the name of Stephen Gardiner, the Tudor Bishop of Winchester, is known to everyone.

Corpus Christi College, or, in full, the College of Corpus Christi and the Blessed Virgin Mary, was founded in 1352 by certain members of two Cambridge Guilds, that of Corpus Christi and that of Our Lady. Its inner court is of immense interest as being the oldest quadrangle in the university, adjoining which is the Saxon Tower of St. Benet's Church. It was on account of its proximity to St. Benet's that the college was commonly called Benet Hall. One of the greatest benefactors of Corpus was Archbishop Parker, who bequeathed to the society his unique collection of MSS. Bacon, the Lord Keeper, Christopher Marlowe and John Fletcher were among the many Corpus men whose names are widely known.

King's College takes its name from its pious founder, Henry VI, who planned for Cambridge a college in connection with his splendid foundation of Eton. This he began in 1441 on a quite modest scale, but almost immediately he enlarged his design on a scale the greatness of which can be judged by the sole remaining completed portion

of the projected buildings. To this, the chapel, its vast size, vaulted roof, magnificent screen and stall work, superb organ-case, and wonderful range of storied windows, give an unique value among the ecclesiastical buildings of the world. Membership of the college was, according to the founder's intention, confined to Eton scholars, and King's men were, until the middle of last century, exempt from university examinations. The college is now open to the whole world. Among the notable men bred within its walls mention may be made of Walsingham, Sir Robert Walpole, Lord Stratford de Redcliffe and Henry Bradshaw.

Queens' College. The position of the apostrophe in the title is explained by the fact that two Queens, Margaret of Anjou and Elizabeth, the consort of Edward IV, were its foundresses. The former began the work in 1448, naming it the Queen's College of St. Margaret and St. Bernard. Unhappily for her, the Wars of the Roses ended her career, but Elizabeth Wydeville, wife of Edward IV, who had been Queen Margaret's lady-in-waiting, took up the task which the latter had left unfinished. In 1475 the statutes that Elizabeth gave to the college describe her as the *vera fundatrix*. Thus it is that the college exists by the patronage of two queens. Much of the work of Elizabeth's day survives, and the fine gate and the president's lodgings are of the greatest interest. Names associated with Queens' and famous in the world are those of the Blessed John Fisher (once President), and Erasmus.

St. Catharine's College was founded in 1473 by a Provost of King's, Robert Woodlark. Not one of the larger colleges, it is notable for the charm of its court, and for its bed-roll of well-known names, as Archbishop Sandys, Bishop Overall, James Shirley the dramatist, John Strype, Bishops Hoadly and Sherlock, and Nevill Maskelyne, the astronomer.

Jesus College has an unique character among Cambridge colleges, which, unlike those at Oxford, are of a secular and domestic type as contrasted with the monastic. It is, in fact, a mediaeval convent converted, the nunnery of St. Mary and St. Radegund. This ancient religious house was founded in King Stephen's reign on a site given to it by Malcolm IV, King of Scotland and Earl of Huntingdon. The cloister is the remaining characteristic conventual feature, and the existing chapel represents a portion of the great church of the nunnery. At the close of the fifteenth century the convent had become so disordered that the Bishop of Norwich, Alcock, obtained its dissolution, and converted its buildings to an academic use. Among its *alumni* it numbers Cranmer, Bancroft and Sterne, all Archbishops; Laurence Sterne and Samuel Taylor Coleridge. The buildings are of peculiar interest, and the chapel and the remains of the chapter-house entrance from the cloister are of exceptional beauty.

Christ's College, like St. John's, owes its foundation to the munificence of Margaret Beaufort, Countess of Richmond and Derby, Henry VII's mother. It had previously existed under the name of God's House, but in 1505, when the Lady Margaret came to its succour, it was almost extinguished by poverty. In her pious work of reconstruction, she was aided by the counsels of the Blessed John Fisher, Bishop of Rochester. The college buildings are noted for the magnificent

gateway, the charming first court, and the garden front. The greatest member of the college was John Milton, of whom visitors are reminded by a tree in the garden traditionally called "Milton's mulberry tree." Two minor poets, Francis Quarles and John Cleveland; two of the Cambridge Platonists, Henry More and Ralph Cudworth; William Paley, author of *Evidences of Christianity*; and Charles Darwin are a few of the many distinguished men educated here.

St. John's College was founded in 1511, in place of the suppressed Hospital of St. John, by the bounty of Margaret, Countess of Richmond and Derby, already foundress of Christ's College. The Blessed John Fisher, Bishop of Rochester, helped her with his counsel in planning these two institutions, and is regarded as practically co-founder with her of St. John's. The society at first consisted of a master, thirty-one fellows, and twenty-four scholars, residing in the present first court, which is entered through a noble gateway. St. John's, founded as it was when the New Learning was making itself felt, became its chief centre in Cambridge, and Ascham, Cheke and Watson were its great exponents. Since then scholarship and science have been maintained by a legion of St. John's men. In poetry William Wordsworth, in statesmanship Burghley and Palmerston, in classical scholarship Richard Bentley added lustre to the fame of this great college.

Magdalene College was originally a Society of Benedictines from Croyland Abbey, and bore the name of Buckingham College. "The Monks' College," as it was often called, was dissolved with the Abbey at the Suppression of the Monasteries, but was refounded by Lord Audley of Walden in 1542. His heirs are to this day the visitors of the college, and the owners of Audley End, the Neville family, have the right of appointing the master. Magdalene is happy in possessing the library of its most famous member, the inimitable Samuel Pepys. It is housed in a beautiful building erected in his lifetime. Other famous Magdalene names are those of Charles Kingsley and Charles Stewart Parnell.

Trinity College, though under this name it dates only from 1547, is the heir of two much older communities—King's Hall and Michael House founded, the latter in Edward II's reign, the former in Edward III's. The founder of the new college was Henry VIII, who seems to have planned a society that should outlive Wolsey's great foundation of Cardinal College, now Christ Church, Oxford. Its buildings, both in scale and in their variety and beauty, are immensely impressive, whether one is standing in the Great Court, or in the smaller one known as Nevile's. This latter, with its three covered walks and Wren's splendid library at the end, is unsurpassed by anything in Cambridge. So many are the names of Trinity men distinguished in Church and State, in scholarship, law, art, literature, science, and in every walk of life that a selection here would be useless. It may, however, be noted that, of the two Universities, Cambridge has been the nurse of the greater poets, and in this respect it may be remarked that, while Pembroke can boast its Spenser and Christ's its Milton, Trinity in last century owned its Byron and Tennyson.

Gonville and Caius College began its history in 1349 as Gonville Hall. A little over two centuries

later, in 1558, John Kees, a member of Gonville Hall, greatly augmented its endowments and beautified it with buildings, especially the symbolic Gates of Humility, Virtue and Honour, through which the scholar was supposed to pass on his way to a degree. Kees, or Caius, as he chose to spell his name though the pronunciation remained unchanged, was a medical man, and the university is indebted to him for its Medical School. Caius College, to give it the name by which it is commonly known, has been pre-eminent as a nursery of the art of healing, though it also has a fine record of distinctions in the other departments of learning.

Emmanuel College was founded in 1584 by Sir Walter Mildmay, Chancellor of Exchequer to Queen Elizabeth. From the first it was associated with the ideals of Puritanism, and many of its members were among the refugees who fled to New England in the next century: John Cotton, Nathaniel Ward, Thomas Hooker, and, most notable of all, John Harvard. Archbishop Sancroft and Bishop Hall, however, provided an antidote to the *virus* of Puritanical doctrine. The Cambridge Platonists, of whom mention has been made above, were strongly represented at Emmanuel by Sterry, Cudworth (who was also of Christ's College), Whichcote and Culverwell. As at Pembroke and Trinity, Wren left his mark on Emmanuel College in the chapel and cloister which he designed in Sancroft's mastership.

Sidney Sussex College owes its name to its foundress, Sidney, Countess of Sussex, by whose will it was established in 1596. Not many years passed over it before some of its members took a conspicuous part in the sides of King and Parliament respectively. Oliver Cromwell was the most famous of all Sidney men, being admitted a Fellow-Commoner in 1616. The College Register, edited later by an ardent Royalist, describes him as *grandis ille impostor, carnifex perditissimus*. On the other side we find such names as Roger L'Estrange, Abbot Montagu, Archbishop Bramhall, Bishop Seth Ward and the historian, Thomas Fuller.

Downing College was begun in 1807 out of property bequeathed, in default of heirs, by Sir George Downing (*ob.* 1749), the owner of a name perpetuated also in Downing Street, Whitehall. On the advice of the younger Pitt, this new college led the way in university reform, by allowing Fellows to marry, limiting their Fellowships to a term of years, and also supporting a university professor. In obedience to the request of George III, the authorities erected the college buildings in the Grecian style.

Selwyn College, founded in 1882, commemorates the name of the great missionary bishop, George Augustus Selwyn, who built up the Church in New Zealand, and then ended his days as Bishop of Lichfield. According to its charter, it exists as a house for Churchmen willing to live economically. Like Kettle College at Oxford, it has rapidly grown in numbers, and the Selwyn men are able to give a good account of themselves in the world.

A. REYNOLDS.

CAMDEN SCHOOL.—(See NORTH LONDON COLLEGIATE SCHOOL FOR GIRLS.)

CAMDEN, WILLIAM (1551–1623).—Born in London and educated at Christ's Hospital, St. Paul's School, and three different colleges at Oxford,

he graduated in 1573, and two years later became second master at Westminster School. In his leisure hours he devoted himself to the study of history and a survey of the British Isles. His *Britannia*, first published in 1586, was written in Latin, and soon became a standard book of reference. In subsequent editions it was greatly enlarged, and was translated into English by Philemon Holland in 1610. Camden became headmaster of Westminster School in 1593, and in 1597 was appointed Clarenceux King-at-Arms. He then resigned his mastership, leaving a Greek Grammar for schools, which, in course of time, went through a hundred editions. Camden had now more leisure to pursue his studies; and his most important historical work, which was published in 1615, took the title *Annales Rerum Anglicarum et Hibernicarum regnante Elizabetha*. This work contains a history of the life and reign of Elizabeth to the year 1589, and is supplemented by a second part, which was published in 1627. Lord Burghley had suggested this work to Camden, and had provided the rolls, memorials, and records of Elizabeth's reign for his use. To Sir Robert Cotton the writer was indebted for access to charters, letters, notes of consultations in the council chamber, and instructions to ambassadors, as well as records of the proceedings of Parliament. The form of the work is that of Annals, but the facts are told in their relation to each other, in order to make a continuous and interesting narrative. Among other important works of Camden are a narrative of the works of the Gunpowder Plotters and a list of the epitaphs in Westminster Abbey.

Camden died at Chislehurst, Kent, in the house afterwards occupied by Napoleon III and the Empress Eugénie in their exile after 1870.

The Camden Society, founded in 1838, was named in Camden's honour, and published early historical remains.

CAMERA AS AN INSTRUMENT FOR TEACHING PURPOSES, THE.

—The value of the lantern slide to the teacher has been increasingly recognized in recent years, and the more enlightened education authorities equip their schools with lanterns and darkened rooms. The London County Council has a catalogue of 50,000 slides in its possession, from which teachers are able to select slides to illustrate their lessons. A small committee of experts drawn from elementary, secondary, and technical schools advises the Education Officer on the purchase of new slides. So important was this work considered, that the L.C.C. continued to add many new slides during the Great War. Many sets have been bought from the lantern-slide dealers, but quite a large number have been made by the Council's own photographer from negatives lent by art galleries, corporations, travellers, and teachers; while some have been presented by Colonial Governments, railway, and steamship companies.

Yet, excellent as these slides are technically, the teacher often finds his own picture more effective; not only because it has been photographed from his own standpoint and designed to tell some specific story, but also because he can give a clear account of its surroundings and often add interesting little anecdotes connected with its taking. The most perfect slide may fail to teach its lesson if not transformed into a living picture by clear, vivid description. Hence the camera is rapidly becoming regarded as a necessary part of the equipment of

the progressive teacher; and as photography appeals to the intellectual and artistic side of a man's nature, it makes an admirable hobby for a teacher.

A careless person can make the hobby very expensive; but without encroaching on the professional portrait photographer's sphere, it is quite possible to make the camera pay: directly by illustrating articles for books, or for the Press; by making lantern slides and lecturing; or by offering prints and slides in exchange for benefits received, or as gifts.

It is easy to see how useful the camera can be to the teacher who wishes to write or lecture on some educational work he has in hand (e.g. scientific apparatus or experiments, handwork models, physical exercises, school plays or concerts, play-ground classes, school gardens, school journeys).

He can also use it to make records of classes, teams, types of children, etc.; and he will find that a photograph is a reward much valued by a scholar.

Using the camera for education pure and simple, the teacher will always have the lantern slide in view. During a holiday or on Saturday excursions he will encounter hundreds of subjects "asking to be taken," that is, if he had his children on the spot he would want to stop and use the subject as a teaching illustration. Instead of that, he takes the photograph to the children.

Geography lends itself best of all to lantern illustration, and the inexperienced camera man will find it easier to achieve success with scenery than with interiors, pictures, growing plants, or animals.

At the seaside he will be able to "snap" with a guinea hand-camera such features as cliff, beach, waves, groyne, cape, bay, harbour, pier. With increased experience and skill he will learn how to emphasize and even exaggerate the essential *vital* point in a picture, almost as readily as in a piece of recitation.

Rivers are the easiest of all subjects; in fact, the beginner should always go to a stream if he wishes early success. The source, waterfalls, the bed (when exposed), steep and shallow banks, river bends, bridges, lakes, ponds, mills, will all compose pretty pictures and provide good slides for the young child's geography lesson.

Hills and mountains require more skill; but it will be fairly easy to secure silhouettes of hills, ignoring detail and contenting oneself with a sharp black outline against a light sky. It will be found that the different rocks and stratifications have distinctive outlines of their own. Valley slopes also deserve attention, for they depend on the speed and age of the stream, and the nature and stratification of the rocks on each side. Striking geological forms, quarry, and other "sections"—showing stratification, glaciers, glaciated rocks, perched blocks, rocking stones, etc.—will naturally call for the camera's attention.

Political geography is equally capable of illustration: e.g. animal and vegetable productions, industries and occupations, methods of transport, types of people, and dwelling-houses.

It is in dealing with towns and villages that the teacher's slide will at times eclipse that of the professional photographer, who generally has the picture post card in view. Thus, instead of taking Sheffield Market Place, or even the Cutlers' Hall, we should aim at securing for the child of nine a

picture of the heavy clouds of smoke hanging over a forest of chimneys. At Rugby we would certainly take Arnold's school, and the birthplace of Rugby football; but we would also search for a good spot (probably on a bridge) from which to show the complex network of railway lines which focus at the station, with the B.T.H. electric works at the side. In a Cotswold village, a typical picture would emphasize the ever-present stone wall which here replaces the hedge.

Occasionally it is possible to combine in one picture all the points for which a place is noted. Thus, Carnarvon Castle, with the trucks bringing slate to ships in the harbour close by; or the River Severn at Worcester, with the cathedral, and sauce, glove, and porcelain factories on its banks.

History. A stand camera will be required to get the best results with historical subjects. Castles, abbeys, churches, gateways, old houses (especially interiors) require more careful focusing and arranging than is possible with a hand camera. The history teacher who knows his subject will see many teaching pictures in ancient camps, barrows, tumuli, and monuments which the ordinary amateur might pass as of no beauty or importance. Many of the slides required to illustrate history are copies of old documents or pictures.

Literature. Usually the slides show the portraits and homes of great writers. In some cases, various places mentioned in a poem or story are photographed to form a series; but little attempt has been made to illustrate dramatically the well-known poems and stories of literature.

Nature Study can be illustrated on the lantern screen, but the wise teacher will strive, whenever possible, to take the children out to Nature or to bring Nature into the classroom. Children should be able to watch a tadpole go through all its stages to the adult frog. At the end of the time, a series of lantern slides may be useful for revision and comparison with their own sketches. For older children, photographs of microscope slides will be useful, and the teacher who has both camera and microscope will find the making of them quite fascinating.

The ecological problems of Nature Study are still awaiting full illustration by the camera.

Practical Photography. The beginner is advised to get one of the many primers, such as *Photography Made Easy*. The limited purse of the average teacher is assumed; hence he is not advised to buy a film camera, which is a luxury for the rich and lazy, or a necessity for the Press photographer. A two or three-guinea box hand-camera to take a dozen plates will be the handiest companion for a holiday, and is the best to start with, unless the teacher is taking up photography for historical or scientific purposes, in which case he will do better with a stand camera. The quarter-plate size ($3\frac{1}{4}$ in. \times $4\frac{1}{4}$ in.) is undoubtedly the best, for it enables lantern slides of $3\frac{1}{4}$ in. \times $3\frac{1}{4}$ in. to be made by direct contact.

The most important thing in photography is to secure correct exposure in the camera. Pyrogallol acid gives the best results as a developer for plates, hydroquinone for lantern slides, metol-quinol (M.Q.) for gaslight and bromide papers; but M.Q. may be used for all three.

Correct development can be secured by ascertaining the "factor" of the developer. Thus, if the factor be 5 and the image appears 30 sec. after immersion, the negative is fully developed at the

end of 2½ min. Once in possession of a negative, all sorts of things can be obtained from it—

(a) Purple prints on P.O.P., by printing in a frame in daylight, toning with gold, and fixing as with plates.

(b) Gaslight prints, by printing before a flame, and then developing in subdued gaslight followed by "Hypo" as usual.

(c) Lantern slides, by exposing a lantern plate for a few seconds to a flame, developing in red light and fixing as before.

(d) The negative may be placed in an enlarging camera, and the image thrown on a large sheet of bromide paper, which may be developed in yellow light and then fixed.

Notes on Lantern-slide Making. Experience is required to hit the correct density in developing slides. Unlike a negative, the slide must be just right, or it is of no use. Different makes of plate appear differently when viewed through the glass, or at the back. It is better, therefore, to keep to one make of plate, and use the same developer; a developing "sense" will soon be acquired with practice. Instead of tinkering with a poor slide, it is better to immerse it in dilute HCl; peel the film off, and use it as a plain cover glass.

It is advisable to use masks with different openings, for attention can often be concentrated by ruthlessly obliterating useless portions of the slide. Primus spot binders are convenient for small quantities of slides. Great care should be taken to bring the two spots over on to the cover glass, to ensure "right way round" for the picture on the screen. G. G. L.

CAMERA.—(See APPARATUS, HOME-MADE.)

CAMERARIUS, RUDOLF JACOB (1665–1721).—Was born at Tübingen, where he studied philosophy, natural history, and medicine. He became assistant demonstrator at Leyden University, and afterwards visited most of the countries of Western Europe, studying medicine. He received the degree of Doctor of Medicine at the University of Tübingen, and assisted his father there as professor of medicine. He was also appointed inspector of the botanical garden, and published numerous botanical works.

CAMPANELLA, THOMAS (1568–1639).—Born in Calabria. He was endowed with a remarkable memory; became a monk at 15 and famous philosopher at 23. He then travelled and taught, following the teachers who were striving to free the human mind from Aristotelian tyranny. His great learning, earnestness, and eloquence made many converts; but at Bologna his manuscripts were seized and he was handed over to the Inquisition at Rome. He was liberated and returned to Calabria (1598), where he preached political liberty against Philip of Spain. Betrayed by associates in a conspiracy he had organized, he was imprisoned for twenty-seven years. He devoted his prison life to philosophical and political study and writing, attempting to re-construct the foundations of logical, philosophical, and political thought. In his *Philosophia Sensibus Demonstrata* (1591) he defended Telesio, the leader of the revolt against Aristotle; in *Prodiromus Philosophiae Instaurandae* (1617) he gave his plan for reconstructing the edifice of human knowledge. He continued the latter work in *Rational Philosophy and Universal Philosophy* (1638). In his political writings he outlined

a republic like that of Plato, but presided over by Christ.

CAMPE, JOACHIM HENRY (1746–1818).—A German pedagogical writer; was born at Deensen, Brunswick; and studied theology at Halle. In 1773 he became almoner in a Prussian regiment; but, moved by the miserable condition of the people, began to occupy himself with education in the hope of improving the condition of the young. After Basedon's death, he was for some time director of the Philanthropinum at Dessau, and later he established a private institution at Hamburg, which he gave up in 1783 on account of ill-health. In 1787 he became educational adviser in the Duchy of Brunswick and proprietor of a library which, under the name of *Schulbuchhandlung*, became one of the largest in Germany. When he gave up the library, he handed it over to his son-in-law, Vieweg, who added to it a printing-press and a manufactory of paper. In 1809, in recognition of his services to education, he was made doctor of theology at Helmstadt. His educational and philosophical works were all designed to ameliorate the lot of the poor. He wrote, in a style suitable for young readers, thirty-seven volumes of *Works for the Use of Infants and Young People*; his *Robinson the Young* has been translated into every European language; his *German Dictionary*, in five volumes, was of high merit.

CAMPOMANES (Pedro Rodriguez, Count of). Was born at Santa Eulalia de Sorribas, Asturias, 1st July, 1723; and died at Madrid, 3rd February, 1803.

Campomanes was one of the most influential statesmen of the reign of Carlos III of Spain. Dedicated to the Law in his youth, he held the offices of Postmaster-General and Minister of Finance, and, subsequently, President of the Council. He took an active part in the expulsion of the Jesuits in 1767 (see ABARCA Y BOLEA), and prepared the greater part of the reforms which followed. He reformed the schemes of studies in the universities, and gave a great impulse to the study of the physical sciences. To his initiative was also due the creation of the famous "Economic Associations of Friends of the Country," which still subsist to-day, and have contributed so powerfully to the development of the national culture and wealth.

Endowed with remarkable classic erudition, influenced by the doctrines of Port-Royal, and devoted to the economic speculations of the age, Campomanes has left to posterity numerous historical, legal, and economic works, among which his *Treatise on the Statutes of Mortmain* (Madrid, 1765) translated into Italian by order of the Venetian Senate; and his *Impartial Judgment*, a work on public ecclesiastical law, translated into French, deserve especial mention. Campomanes belonged to numerous scientific academies and societies, and was a corresponding member of the Academy of Inscriptions of Paris and of the Philosophical Society of Philadelphia; to the latter he was admitted on the proposition of Benjamin Franklin.

Original Work as a Thinker. But, apart from his many labours as a politician and reformer of national education, Campomanes must also be regarded as an original thinker in matters of pedagogy. His well-known work, *A Discourse on the Popular Education of the Working Classes* (Madrid, 1774), which was also translated into

Italian (Venice, 1787), not only constitutes an accurate exposition of the state of the arts and industries of his period, and in this sense possesses a positive value for the historic study of methods of teaching; it also represents a manifest progress in his time in the then reigning ideas concerning popular technical education. This work consists of nineteen chapters, of which the first five are dedicated to the examination and exposition of what the education of the working classes then was, and what in reality it ought to be. According to Campomanes, the education of the working classes should be specialized from its very beginning, and should include, besides technical workshop instruction, elementary teaching in reading, writing, and arithmetic. He considered drawing—geometric, freehand, and applied—as an absolutely indispensable discipline for the attainment of perfection in craftsmanship; and he upheld the necessity of apprentices being constantly exercised in the practice of drawing during the hours when they were not employed in the workshop. He considered instruction in the Christian religion and the fulfilment of religious duties to be the foundations of moral education; and recommended, with much insistency, modesty in deportment, and cleanliness and neatness in dress. He denounced duelling and the passion for the bull-ring. E. JARDI.

CAMP-SCHOOL, THE.—The camp-school was started in 1911 as the result of the work done at the Deptford School Clinic. It was found that two-thirds of all the disease treated in this, the largest school clinic in the country, was preventable; furthermore, that the doctor could not *prevent* it, nor could drugs and liniments ever drive it away. In three months we treated over 700 children for diseases that are due to neglect. And within eleven weeks they were practically *all* back again suffering from the same diseases that had been cured by expensive drugs. Infected and re-infected, they go on in this way for years. The drug-bill, for one year, in a large clinic amounts to three figures. And there are hundreds of school clinics in the country now. Their number will continue to grow; their use and value are no longer in question. They have done great services to the country. But, though the school clinic is a new thing, already it is spending money in ways that cannot yield any return.

But this, of course, is only the smaller evil. We do not state our case in saying "We are wasting money." The great evil, the thing to which Britain can no longer afford to close her eyes is that her children, on whom she depends, who are her greatest assets, and whose hands and brains alone must make good the terrible cost and losses of war, are to-day growing up in circumstances that do not allow them to develop their real powers, that make them, on the contrary, go through life handicapped and dependent in later years on legislation—that is in its very nature an awful admission. Medical benefits and doles are good things to-day, but the need for them is not. The same causes that give us a high death-rate among babies damage the survivors, and affect the output of labour in every department.

Educational systems are at present in the melting-pot. No tinkering here or improving there will serve us. We must have a system that will turn out healthy and able citizens. Given these, a good deal of our present-day legislation will follow our old educational systems into limbo.

Conditions of the Camp-school Work. The Deptford School Clinic was in a poor area, but we were not concerned to specialize in poverty schemes. It is true we had certain things to consider that are peculiar to poor neighbourhoods. Our children lived in crowded homes; we had to find an annexe to these homes. They had no gardens; we had to make a garden. They loved their parents; we had to keep the home ties strong and, more than that, to leave all the final responsibilities with the parents. Our children were not sub-normal; we had to give an education that did not stop at the three R's or before them. Finally, we had to do all this at a small cost, unassisted by any public authority, and with very little hope of any real financial help from parents.

All this may appear difficult. It might have been very easy. We met with difficulties; but none in connection with the problem, only with regard to the authorities. The problem unwound itself like a silken thread from a ball. We got baths, the infectious diseases vanished. We secured wholesome food, anaemia disappeared. We secured a bed for every child, under cover, but with the pure night air all around him and the "nerve symptoms," reports the chief medical officer of that year, "were quite noticeably relieved in a way that astonished us." The Medical Officer of the L.C.C. also declared, after two or three visits, that the camp children shone out from all the others like flowers in the street. The Danish Medical Officer, who paid one visit, afterwards wrote in *School Hygiene*: "In spite of the poor equipment, the actual results are better than in any other open-air school, not excepting Charlottenburg."

Buildings and Finances. But though the problems of salvation and education are not very difficult, yet the position of the authorities was said to be impossible before the war. It is not impossible now. They must either break with tradition and create new precedents, or else stand condemned to old, wasteful, and even fatal methods; and they will sooner or later choose the former course. The Building Acts greatly increased our difficulties. These condemn many temporary buildings of a very good order: cheap, but also spacious, healthy, and also, it may be, beautiful. New builders have to conform to so many regulations that at last they break down in some cases altogether. Social and educational workers, with poor equipment, but striking out into new and hopeful fields of life and labour, can earn no grant.

In spite of all the good reports and testimony of every kind as to the value of the work, our camp-school could receive no help from the State. The buildings and equipment, and *the area itself*, were condemned. "You have insanitary buildings all around," we are told. This being so, no Government help could be given to the clearing and cleansing of any part of it. The reformer stood up armed, as it were, against any reform that was not costly. But huge, expensive schools are not merely wasteful, else we might not say anything about them. They are obstacles to real education. Do we make a great army by building barracks? Do we make a great people by covering the precious sites with blocks of masonry.

When money-aid was refused, we had to give up some precious things. The night-camp, the cause of all the blessed changes that came to our boys and girls, went: we could not pay a night guardian. Home-lessons, play and companionship had to

follow, more or less, because the children were again abandoned in after-school hours. And the breakfasts and suppers that gave a peach-like bloom to our pale and sallow children (a bloom that made even the inspectors exclaim) had to go. But we have our baths still, and fresh air, and an able master. And so our boys and girls speak good English, learn history and French, and music and gardening with some gusto yet.

The Future of Education. In the Great War the male population of nearly all the great civilized nations was driven suddenly into the open. From desk and factory, from suburb and slum, from counter and study they gathered and went. Very rapidly the men of the new armies learned a new trade; and letters received from the Front let us know that never before was the need of better schooling felt by thousands. "If I could but speak French." "If I had but learned how to survey a piece of land, or to find my bearings quickly in a new country." Some men, with little schooling to boast of, and grim work to do, expressed in every letter home the hope that their children might do well at their lessons. "Learn, learn, learn," wrote one man to his motherless little sons; and added rather bitterly, "Then it won't be so hard for you." Educationists, through their Minister, can bring not only pressure but compulsion to bear on all those who prevent the use of free sites, vacant spaces, and waste land. Thousands of acres are available in London. (In a *very* crowded area we have a large waste space on one side of our Baby Camp; another beyond the Boys' Camp; and two vacant and boarded-off spaces, already carpeted with grass, and making a green oasis between soething back streets.) On a low estimate, one-third of our whole school-population should be in some kind of open-air school. For a third of the nation's children the expensive kind of school building will not be wanted. Neither (as we proved) will the most expensive drugs be needed. So much the better; we shall need all our savings and more to meet such an expenditure on education as we are resolved on now. We want cheaper freights, so as to bring the best food to the schools and the homes. I have hitherto been obliged to spend one-third of the whole cost of the food on carriage. We want oatmeal from the Highlands, and apples from the West and South-western counties.

Cheap and clean milk is a necessity. Children themselves can grow vegetables, and tend goats. They do so already in several schools, and it is more amusing than taking object lessons or looking at specimens.

The adolescents of over 15 should be self-supporting during school life, as the Scottish students used to be. They were taught, however, by university men, and had no particular brand of semi-learning presented to them. John Know made the parish school a success, and installed a priestly and kingly father in every home because he did not conceive of secondary and university education as things quite apart from the primary stages of learning.

There will be indoor schools to-morrow of a new type. They may, or may not, be costly. They cannot, we must believe, represent the forward moving impulse of a great race embodying itself in mere stone and mortar.

The cost of the camp school in pre-war days was £10 per head, with part board and education. It was £3 in building cost. The bath cost £30: it

had four shower-baths, and a hot-water boiler. The drainage was £50; the shelter, used for dormitory and schools, cost £120. The boys made the bed-trestles; boys made desks too, and even some of the baby camp furniture. The equipment was poor.

Parents like this open school. They look out from their windows and through the fence chinks. They come in at evening to bid their children good-night. They looked at them playing almost under their own windows. The school relieved the housing problem. It also threw it into relief. Many did not realize there was a housing problem till they saw the camp beds.

We are still far from the unity of aim that would free all our energies. The poorer class of mothers do not connect our efforts with any great world-change. The Infant Welfare Centre, the Baby Camp, the primary schools—even these are still for them disconnected things, separate as dust. Everywhere is fragmentariness of aim, and our nurses stand aside from educational problems. Our teachers swerve from the idea of touching nurses' domain. But these things are of yesterday. The aim of the people will be one to-morrow, and its servants will be as one.

M. McM.

CAMPS, TRAINING COLLEGE.—The numerous experiments of recent years in the training of teachers form one of the most hopeful features of the problem. At Armstrong College, Newcastle-upon-Tyne, various ways have been tried to supply the deficiencies of the ordinary training course. Excursions during a week in June were instituted, students and lecturers residing in a country district: Chatton and Haydon Bridge in Northumberland, Ambleside, and Keswick were, in turn, made centres. The schools were visited and their work examined, great help being obtained from the head-teachers; and it was apparent that this week, spent in schools of a different type from the large town schools from which the students came, had a beneficial effect upon their outlook and subsequent practice. Their efficiency was undoubtedly increased by these excursions.

In 1908, the growing tendency to outdoor life and the rise of camps in general suggested the idea of a training college camp of students and staff, together with a sufficient number of boys to provide material for classes. The Board of Education allowed attendance in camp to count as attendance in school, and practice in camp was recognized as part of the school practice of students. As no funds were available, a fee had to be charged, so that the camp might be self-supporting. The boys were recruited from the elementary and, to a certain extent, from the secondary schools. The cost for a fortnight, including railway and general expenses, was £1 2s. 6d. for boys and £1 10s. for students.

In 1909, the camp was held at Warkworth; in 1910, at Richmond, in Yorkshire; in 1911, at Healey Farm, three miles from Rothbury, Northumberland; this last site was found so suitable, that we made it a base and held camps there in 1912, 1913, and 1914.

The selection of a good site is important; good drainage and a good supply of drinking water are essential. In the earlier camps, tents were hired from the Army Ordnance Department; this was economical, but eventually it was found better to hire from private firms that make a speciality of camp equipment.

The circulars sent out to head teachers asking

boys to join gave careful details as to clothing, etc., to be provided, the packing of the clothing, and other necessary preparations. Parents were asked to certify that their boys were in good health, and to see that they were accustomed to having their bedroom-windows open so that some hardening process might go on.

Forming Camp. An advance party went the day before camp began and erected tents and marquees. In 1914, camp was provided for 110 boys, 51 students, and 4 members of the staff. A large marquee served for an assembly tent and for meals. There were 18 tents for the boys, 9 for the students, and 3 for the staff. There were also tents for stores, cooking arrangements, and tuckshop, besides a medical tent and a hospital tent. A certain amount of equipment for cooking and some crockery has been permanently acquired. The marquee was fitted up with trestle tables, and a piano was hired. Teaching apparatus was also provided, such as surveying chains, simple plane tabling, reference books, exercise books, and note-books.

For cooking arrangements, in the earlier camps, we hired Army cooks and boys from the *Wellesley Training Ship*. In the later camps the cooking has been done by students. Estimates had been obtained in advance for meat, bread, and groceries. The organization at Healey Farm was favoured by a continuous supply of good drinking water. The water was further led into a shallow trench, the margin of which was covered with boards: this provided washing arrangements.

A camp is a complex organism demanding strict supervision and a large amount of labour: tents are to be erected, latrines dug, the waste of camp to be provided for, and day and night patrols arranged. The responsibility of the various duties is a great strain upon students and staff. The proportion of students to pupils is, therefore, large, and the classes are purposely kept small.

Six boys were placed in each bell-tent, one acting as prefect. The students were allotted separate tents, about six in each also.

A typical day's work is—

	A.M.	P.M.
<i>Reveille</i>	7. 0	
Washing Parade	7.20	
Breakfast	8. 0	
Service	8.45	
Tent Inspection	9.15	
Outdoor School	9.30–12.30	
	P.M.	
Dinner	1. 0	
Afternoon School	2.30–3.45	
Tea	4.30	
Supper	8.30	
Service	9. 0	
"Lights Out"	9.30	

An example of a day's work is—

- Tent I. Folklore.
- Tent II. Nature Study.
- " III. Map-reading.
- " IV. Surveying.
- Tents V and VI. Visit to Brinkburn Priory:
Local History.
- Tent VII. Music.
- Tents VIII and IX. Sketching.
- Tent X. Study of Trees.

The curriculum for boys of varying ages is difficult only on the surface, and suggests the possibility of more freedom of classification in teaching certain

subjects in schools. At Warkworth, the interest grouped round the idea of Northumbria and, with Warkworth Castle and Church, and the glorious links, material was ample. At Richmond, the moors and hills were compensation for the absence of the sea.

At Healey Farm, with Simonside in full view, the lovely Coquet close by, and the Black Burn that runs into it passing through the camp, there were all the natural conditions for success. Brinkburn Priory was within half a mile, and the old church at Rothbury and Whitton Tower within 3 miles. Visits were paid to the Peel Tower at Long Horsley and the British Camp at Lordenshaws. The fish hatcheries at Rothbury furnished instructive observation lessons.

About 12.30, the groups returned to camp. At 2.30, they assembled in the large marquee with note-books, and entered up records of the morning's work. Students gave assistance when necessary and afterwards corrected the books. This independent record was of the highest value, and good work was produced.

After school, camp was free, and games or rest followed, or a batch were taken, under supervision, for bathing or a short excursion. The large marquee was provided with books which pupils might consult. Tea was succeeded by games and walks. Afterwards came supper, service, and bed; patrols began their work; and, after the students had had supper, occasional informal meetings were arranged for students and staff, when the work of the day was considered. These meetings, together with the reports the students wrote on the work of the camp, led to valuable results. Many of the reports were of real merit, and gave information and criticism which we found subsequently of great value in college.

A simple religious service was taken morning and evening; and, on Sundays, boys in charge of students attended such local churches or chapels as they selected. The Rector of Rothbury also held a service in the camp. The "religious difficulty" did not disturb us; at Warkworth, all joined in the service save five: four of these were Roman Catholics, and services were arranged for them by two students who were co-religionists; the remaining boy was a Jew, who set an excellent and modest example of adherence to his faith.

One of my colleagues, writing upon Richmond Camp, says of the service—

"This was of the same unsectarian type as at Warkworth, and no difficulties whatever arose. Several teachers took turns at holding service. It is a very important part of camp life, and evening service in the little hollow at dusk, with the boys standing bareheaded and still, was one of the most impressive things it has been my fortune to see. At no time was the feeling stronger that we were all one family, and that we teachers had charge of these lads for the whole twenty-four hours, to care for them, influence them, rouse them: some of our students might have taught half a lifetime in a day school without feeling that."

Each tent had a prefect, appointed by the executive officer. The system worked excellently—responsibility was accepted by the prefects and willing help obtained from the boys. A careful roll-call morning and evening kept us acquainted with the locale of each boy.

Responsibility for the tents was divided among the students, who saw that the boys were prompt

in beginning the day and ended it peacefully. This ensured that, for a fortnight, students were in close relationship with a group of boys, and the testimony of the students is unanimous that this friendly relation formed one of the most interesting experiences of camp. One trusts that friendly ideas established in camp will persist in the more trying days of the large classes in the town school. Every observant head teacher notes the defects of certain assistants, in that they do not seem to get near their scholars, that they cannot live with their class. Their relations are fair and honest, but they have a tendency to be formal, artificial, and school-masterly.

Health. The health of the camp was exceptionally good. In each of the early camps two medical undergraduates gave their assistance, and the medical tent was provided with a simple medicine chest. Casualties were confined to a few slight colds, and the usual small injuries of camp life. There was a medical parade each morning. The medical report of the Warkworth Camp ran—

"The health of all improved during camp. It is with great satisfaction that those in medical charge of the camp place on record the fact that the sudden transportation of over 100 unselected schoolboys from town life—comfortable bedrooms, delicate food, and the unceasing care of relatives—to a canvas encampment by the sea-shore; to sleeping on the ground; to food extremely plain, though good and abundant; to eating, washing, dressing, exercising, studying, and (practically) sleeping in the open air, was attended with no ill results; but, on the contrary, with undoubted benefit to the health and physique of the lads. There were no serious cases; the boys who lined up at sick parade usually needed dermal cream or cathartic medicines."

A dental examination was carried out by the medical officers.

NUMBER OF BOYS, 106. AVERAGE AGE, 13.

	No.
<i>Class</i> I. All teeth good, none carious, not more than two missing .	13
II. Not more than three carious or missing, remainder good .	27
III. Not more than three carious or missing, remainder fair .	54
IV. All teeth in poor condition .	12

At Richmond Camp the medical officers weighed and measured all the boys at the beginning and end of the fortnight. Some of the results are interesting—

89 gained, on the average, 2·06 lb. each;
9 remained unchanged;
14 lost, on the average, 1·42 lb. each.

The 112 weighed thus gained, on the average, 1·45 lb. each.

In 1912, we had a case of scarlet fever which developed the third day; the boy was removed to the local isolation hospital, and camp was placed in quarantine—an inflection borne cheerfully—and no further cases occurred.

At the camp in 1915, medical work was carried out by the staff and students, who were in touch with the Medical Officer of Health for the district.

Food. It may be instructive to give some idea of the quantities of food required. At Richmond,

with 123 boys and 45 adults, the following was consumed—

Bread:
Average per diem 140 lb. Army bread
or 180 lb. local bread

Meat:
Average per diem 60 lb. for boiling
70 lb. for roasting

Potatoes
(for the most part new)
140 stone for the fortnight

Oatmeal . . .	16	"	"	"
Butter . . .	169 lb.	"	"	"
Tea . . .	35	"	"	"
Coffee . . .	15½	"	"	"
Sugar . . .	560	"	"	"
Jam . . .	160	"	"	"

Puddings (either
suet or milk) . about 32 lb. per day

Lettuce and
Spring Onions . 4s.-worth for one tea

Milk . . . 8 galls. per day

Coal . . . } One ton of each for the
Wood . . . } fortnight

Finance. The camp must be self-supporting. In 1908 we had a balance of 5s. 4d. Richmond, held under favourable conditions—we bought rations from the Territorial Army Stores—ended with a balance of £19 8s. 6d. This changed into a deficit of £9 4s. 5d. at the Rothbury Camp, 1912. By revising the charges, there was a balance, in 1913, of only £1 8s. 3d. on the wrong side, which became a credit balance or surplus of £28 1s. 8d. in 1914.

The hire of camp equipment is a heavy charge; if the equipment could be provided and hired out to colleges forming camps, that would make a relief in expenses.

The balance sheet for 1914, on page 267, is given as a guide.

Curriculum. This has already been suggested by the time-table. Some notes from staff and students will indicate broadly the aims we had in view—

HISTORY AT RICHMOND. "One hopes that all students who went on these historical excursions have realized some of the possibilities of outdoor work in local history: some of the benefits of getting away from mere names and dates and all the "dry bones," and of getting at the reality of the lives of our forefathers in ages past. Of course, the opportunities at Richmond are exceptional; one cannot always have a Norman castle, an Eastby Abbey, a Greyfriars Tower, within easy walking distance. But there will generally be a parish church, a bit of old wall, a market cross—some relic of past times to be seen, which may form a foundation for an imaginative picture of the life of the men of the district in times gone by."

At each camp, striking local examples were available.

GEOGRAPHY. Local geography, map-reading, plane-tableing. At Healey Farm, a map of the district was completed by plane-tableing, and the boys were keen in comparing their results with the Ordnance Survey.

SURVEYING. The most interesting feature of the lessons was the great difference between this work in the field and that which in the ordinary school is done on paper with drawing instruments. The boys were obliged to carry a mental diagram of the field for purposes of thought, and this formed an excellent exercise. It was encouraging to see the boys throw themselves into the work with

ROTHBURY SUMMER CAMP (1914)

RECEIPTS AND PAYMENTS ACCOUNT

Receipts.			Payments.		
	£	s. d.		£	s. d.
To Subscriptions—			By Food	85	14 4
102 Boys at 22s. 6d.	114	15 —	„ Hire of Camp Equipment	56	17 4
6 „ „ 17s. 6d.	5	5 —	„ N.E.R. Fares	19	12 —
3 „ „ 15s. 6d.	2	6 6	„ Carting, Portage, etc.	8	17 8
48 Students at 30s.	72	— —	„ Rent of Field	5	— —
3 „ „ „ 17s.	2	11 —	„ School Equipment	1	4 4
1 Visitor „ 30s.	1	10 —	„ Straw	1	10 —
4 Visitors „ 18s.	3	12 —	„ Fuel	1	16 3
1 „ „ 10s.	10	— —	„ Prizes	1	14 6
1 „ „ 7s.	7	— —	„ Postage, Telegrams, etc.	9	6
			„ Medicines, Disinfectants, etc.	4	10 2
„ Armstrong College			„ Sundries	3	19 10
(staff maintenance)			„ Balance carried down	29	9 11
„ Visitors (teas, etc.)					
„ Profit on Sale of Fruit,					
Sweets, etc.					
„ Donations to Prize					
Fund					
	£220	15 10		£220	15 10
To Balance, being surplus			By Deficit brought forward from 1913	1	8 3
for 1914	29	9 11	„ Balance carried down	28	1 8
	£29	9 11		£29	9 11
To Balance brought down,					
being surplus in bank	£28	1 8			

a determination to master the elementary principles, and two enjoyable and profitable mornings were spent.

NATURE STUDY. Extracts from report of Mr. A. D. Peacock, M.Sc.—

“Our apparatus comprised the following: Butterfly nets, 3; dredging nets, 2; setting-box and gear; collecting tins; killing bottle; microscope.

“Books *Wayside and Woodland Series*, *Flowers, Trees, Moths, and Butterflies*; Furneaux's *Outdoor World*, 2 vols.; Butler's *Pond Life*; Long's *School of the Woods and Wilderness Ways*; Roberts's *Kindred of the Wild*; Watts's *Flora*, 2 vols.

“The books were to be used for ‘spotting,’ and were only to be servants. By reason of their excellent illustrations and letterpress, boys could use them without any assistance. The ‘*Flora*’ was used by the teachers when a difficult case of identification came before them. The books of Long and Roberts were taken for special reasons. These men have had special opportunities for observation of animal life. From the point of view of both ideas and expression, the works are unique. The fine sympathy of their words, the virility and health of outlook, the wonderful craftsmanship of illustration, make them inspiring books for lads. It was a pity that we had not more of them, also similar books of Jack London and Seton-Thompson, for they were in great demand during the bad weather, which was frequent, and during periods of boyish rest and reflection, which it must be confessed, were not so frequent.

“As many as forty boys, and never less than thirty, with about four teachers, formed a day's section. There were two sections, Botanical and

Zoological. Alternate days were devoted to each subject—nominally, that is, because there was a glorious uncertainty about what each day brought forth. If there was a lucky zoological find on a botanical field-day, it was not passed by. The day the botanical section was out, the zoologists worked at some subject other than natural history. The next day was devoted to zoology with the special section, while the botanists did something else somewhere else. In the second week, things were reversed.”

The Effect on the Boys. Students write. “The moral training derived from a school camp may first of all be seen in the spirit of self-reliance that grows up in the individual as the days increase. Each boy has to rely to a great extent upon his own initiative; he has to make his own bed, to help in the keeping of the tent in good order, etc. This training of the initiative in the young is excellent. In this age of rushing for results, the true meaning of Education is forgotten. A well-educated person, it is to be remembered, is not one who can pass an examination, but one who is able to shift for himself; and this is what camp life brings out. Sooner or later in the school of life, the boy will learn that his greatest friend or enemy is himself. To rely on oneself is one of the lessons that are too often learned in the bitter school of experience.

“Some of the boys were perhaps inclined to question authority at first, but generally this spirit quickly subsided and died a natural death. Perhaps this may be accounted for by two main reasons: (1) There was always something ‘on,’ something to interest them, something to do, to see. Their leisure time seemed crammed with action. If it

was not football, then it was swimming, catching rabbits, sorting specimens, and exploring fresh fields and pastures new. (2) These boys, who perhaps from previous slackness of discipline in school, were inclined to doubt authority, found themselves in a minority—a decided minority—a state of things most boys under 15 dread."

The Effect on the Students. "One and all declared that they had learned more about boys than at any other period of their lives. It supplied them with a fortnight much more valuable than an ordinary fortnight's teaching practice. It proved to them, or at any rate to the great majority, the great supremacy of natural methods over the largely artificial methods employed in many of our schools. But the most important part of the experience of the students was that which they obtained from studying the boys individually and intimately.

"He (the teacher) no longer had his class symmetrically arranged before him in silence and prim order, in conditions in which he spoke and they listened; but he was in the midst of a group of observing boys, who were telling him what they had seen and asking for information. He now simply guided the attention of the boys and they learned direct from Nature. The difference to the teacher was enormous; and now when the boys in their unrestrained converse with him, laid open their dispositions, he felt able to exert a more deep and subtle guiding influence upon them than he had been able in a town school.

"The formal lesson of fixed length, with black-board, chalk, etc., had to be given up and a pithy talk substituted. The boys were much more alert and active, possibly on account of the changed relations between teacher and scholar, and the healthy outdoor life they were living. The boys were very inquisitive, and were always finding something they wanted explained."

The general result, from the staff point of view may be summarized—

"There can be no question but that the general efficiency of the students was improved by the experiment. They will be more alert, more receptive, more humane. They will understand, appreciate, and respect boy nature the better. They will see greater possibilities in teaching, and will be more daring in venturing into new experiments. They will be more competent class teachers for our schools. Form and matter for instruction will be seen in due perspective, but will not overpower reality. Health, physique, and the humane influences will be in the less danger of being sacrificed to mere instruction, seeing that students have lived for a fortnight in such close companionship with boys."

To the staff, camp experience is of the greatest importance. It enables them to appraise the values of the students with greater confidence than their ordinary intercourse in college allows. Students who had not impressed us from their studies or their school practice displayed interests and activities that we had failed to recognize, and distinctly contributed towards the success of the camp. They were often eminently successful with their group of boys. On the other hand, we discovered cases in which successes in the lecture-room and laboratory, nimble criticisms of lessons, and even clear exposition in front of a class, had misled us. Such students were lost for a time, divorced from the artificial conditions of the classroom.

Many details can barely be mentioned: the

appreciative comments given by the boys and students; the visiting day for parents; the tuck-shop; the help of local historians and naturalists.

Camp was aided by the fact that most of the students were members of the Officers' Training Corps and were imbued with discipline and had experience of camps. The hard work fell upon the staff; and Mr. J. M. Forster, the Principal of Dudley Training College, and Professor A. E. Dean, the Principal of the Albert Memorial Training College, Exeter, gave enthusiastic service. Ex-students also came to our assistance.

The "hub" of the camps has, however, been Dr. Godfrey H. Thomson, Lecturer in Education; and to his genius for organization the success of the camps is in a great measure due.

We had visits from H.M. Inspectors, who approved of the experiments in unmeasured terms. Mr. P. A. Barnett, H.M.I. for Training Colleges, paid a two days' visit to Richmond, inspected camp; walked round the neighbourhood; and saw parties at work on history, geography, and natural history. He writes—

"You may certainly say that the T.C. Camp experiments which you have been making seem to me most valuable, and that I expressed warm approval of what I saw. So much 'pedagogy' is make-believe that everything which, under first-rate conditions of health, brings teachers and children into contact with real things is of high importance." M. R. W.

CANADA, EDUCATION IN.—The Constitution of the Dominion of Canada gives to each province full control of its own educational affairs, with one modifying provision. In provinces in which separate schools have been established under authority from the Dominion Parliament for Protestants or for Roman Catholics, the minority, whether Protestant or Roman Catholic, has the constitutional right to appeal against any school law passed by a Provincial Legislature, if the minority consider the law unjust. The appeal must first be made to the Legislature that enacted the law. Should the Legislature refuse to grant the desired relief, the minority has the constitutional right of appeal to the Supreme Court of Canada, and ultimately to the Privy Council of the Empire, if the Supreme Court of Canada has decided against the appeal. The Dominion Parliament has power to grant special aid to the schools throughout the Dominion to encourage a more thorough training in any great department of national production. The Dominion Parliament has already made a grant of 10,000,000 dollars to secure a more efficient training in agriculture. This amount was divided among the provinces of the Dominion proportionately on the basis of population.

Alberta. In Alberta, educational affairs are controlled by the Department of Education, of which the head is the Minister of Education, a member of the Provisional Government. The Minister of Education has authority to make the regulations for the general government and management of all the schools of the province: Public (or elementary), Separate, High, Technical, and Normal schools for training teachers. These regulations become effective as educational law when approved by the Lieutenant-Governor in Council. The Minister of Education has an Advisory Council of five members, who give advice about regulations, text-books, courses of study, and other educational questions.

Under the general regulations of the Department of Education, the management of the schools is in the hands of the local authorities. Local boards of education, elected by popular vote in each school district, select teachers, decide the amount of money necessary to carry on the school, and perform such other duties as the Department of Education may require. The province is subdivided into public school districts by Government authority. A Separate school may be established in any Public School District by either Protestant or Roman Catholic ratepayers, provided that a majority of such minority votes in favour of such a school. When a Separate school has been established, the school taxes of the supporters of such school in the Public School District in which it is situated are paid to support the Separate school instead of the Public school. There are yet few Separate schools except in cities. The Separate school trustees are elected by popular vote, as the trustees of Public schools are. The schools are supported by local taxation and by legislative grants. In rural districts the local school rates are based on acreage, but these rates must not exceed 10 cents per acre. The amount of the Government grant varies according to local conditions, and it is based on the following considerations: (1) The area of the district; (2) the number of days per annum the school is open; (3) the qualification of the teacher; and (4) the regularity of attendance. In a district containing 6,400 ac., a grant of \$1.20 per day is paid up to 210 days. In districts of less than 6,400 ac., 1 cent additional per day is paid for each 160 ac. In districts of over 6,400 ac., a corresponding reduction of 1 cent. per school day is made, but no school receives less than 90 cents per day. An additional grant of 40 cents per day is made for every day the school is kept open above 160 days for a period not exceeding 50 days. In city, town, and village districts, local taxation is based on the value of real and personal property. The Government grants are: (1) 90 cents for each day the school is open; (2) 10 cents additional if the teacher holds a first-class certificate; (3) a varying grant based on the average attendance of pupils. This grant varies from 5 to 25 cents a day. Both cities and other districts may receive a maximum grant of 15 cents per day, based on the inspector's reports. For these grants, each room in charge of a teacher ranks as a district, provided that the attendance per teacher is at least twenty for the whole school. Special grants are made to very small schools, and for secondary school work in continuation grades. No religious instruction is allowed by law in the schools except during the last half-hour of the day. Such religious instruction as the school board approves may then be given, but those children whose parents do not wish them to receive religious instruction are permitted to retire before the last half-hour. Moral instruction is given in connection with the regular lessons in other subjects. It is permissible to open the schools by reciting the Lord's Prayer. The Province of Alberta is well organized for technical education and its related preparatory training—the kindergarten, manual training, and other departments of pre-vocational work. The Education Department of the province practically enters into special partnership with cities and towns establishing technical schools. The Department has a very efficient department for the development and inspection of these schools. The official regulations provide for medical inspection

Trustees have authority to conduct night schools, especially in cities and in the department of technical education; they have been very successful. To give teachers the opportunity of qualifying to teach special subjects, an excellent summer school is annually conducted to give instruction and practice in agriculture, school gardening, nature study, zoology, botany, art, household arts, manual training, and physical training. Three agricultural schools are conducted under the direction of the Minister of Agriculture and a Board of Agricultural Education. Alberta has a fine university in Edmonton.

British Columbia. Education is directed by a Council of Public Instruction. One member of this Council is a member of the Provincial Government. The chief executive officer is the Superintendent of Education. He is appointed by the Lieutenant-Governor in Council, and is assisted by a staff of inspectors of districts and two provincial inspectors: one of manual training and one of agriculture and forestry. The Superintendent has large powers in British Columbia—both administrative and supervisory. He is *ex-officio* the Secretary of the Council of Public Instruction, and is really the executive head of the school system. The province is divided into school districts, each managed by a local board of trustees, elected by the qualified voters of the district. In rural districts, the wives of qualified voters are permitted to vote for trustees. High schools and collegiate institutes are under the management of the local district trustees, and, as such, the trustees are called collegiate institute boards. A collegiate institute is a large high school. The Government of British Columbia bears a large share of the cost of its education. It builds the first school in each rural district. The annual grants made by the Government are paid in accordance with the number of teachers employed, varying according to the classification of the district or city. In cities of the first class, the grant is \$360 for each teacher each year; second-class cities receive \$420 per annum for each teacher; and third-class cities, \$465; and rural schools, \$480 per annum for each teacher. The teachers in the two collegiate schools affiliated with McGill University receive similar grants. Where the local authorities add to the salary paid by the Government, the Provincial Treasurer increases the amounts specified by half the amount of the local increase in cities. In rural districts, the Provincial Treasurer increases the grant by giving an additional amount equal to the amount raised by the district to increase the salary of the teacher, and the Government grant is paid direct to the teachers monthly. The Superintendent of Education has authority to open "assisted" schools in sparsely settled districts. In such schools the Government fixes and pays the salaries of the teachers. Schools are classified in British Columbia into graded or common schools, and high schools. Graded schools correspond to elementary schools in England. High schools may be established by the central authority in municipal school districts, provided that in each district there must be at least twenty pupils qualified to attend. Until recently there had not been a provincial university, but one has now been provided by the Government. There were two collegiate institutions in affiliation with McGill University, Montreal, which were classified by the Government as collegiate institutes. The Council of Public Instruction conducts a Normal school for the training of teachers.

British Columbia is progressive in allowing the teacher who taught the child during the past year to determine chiefly the question of his promotion. Manual training is provided in the larger cities. A three years' course is compulsory for boys above the junior grade. Some rural municipalities conduct manual training classes, while domestic science centres are provided for girls. Night schools are established in cities. Indian children are educated in industrial boarding schools by the Government of the Dominion. No religious creed is allowed to be taught in the schools; they are opened by reading the Lord's Prayer. Provision is made for school medical inspection.

Manitoba. The schools of Manitoba are under the control of the Department of Education, presided over by the Minister of Education. The chief officers under the Minister are a Superintendent, and a Deputy-Minister (who directs the work of twenty-two inspectors). An Advisory Board of twelve members has power to make regulations for the construction, equipment, classification, organization, discipline, and government of normal, model, and public schools; to authorize text-books, and prescribe the form of religious exercises in the schools. It also determines the qualifications of teachers and inspectors, decides disputes and complaints, and generally advises the Department of Education. Eight of the twelve members of the Advisory Board are appointed by the Lieutenant-Governor in Council, two by the public and intermediate school teachers, one by high school and collegiate school teachers, and one by the school inspectors. Each school district has three trustees in rural districts, and two trustees for each ward in cities, towns, and villages. In rural municipalities, the council of the municipality has power to levy and collect taxes for the support of the schools, and to unite, divide, or re-arrange school districts, subject to appeal to the judge of the county court. In cities, towns, and villages, school boards have full control of the management of the schools, subject only to the law and departmental regulations. Any board of trustees has power to provide for instruction in manual training, domestic science, nature study, school gardening, physical training, technical and industrial training, or any other form of training approved by the central Advisory Board. The grants are made primarily on the basis of the number of teachers employed. The Provincial Treasurer pays \$65 per annum for each teacher. A bonus of \$25 each year may be given to each teacher in a rural school holding a certificate in agriculture. Where children are driven to school in carriages provided by the authorities, the Government pays one quarter of this expense. Special grants are given as follows: Each school with an intermediate department receives annually, \$200; each school with a high school department, \$300; and \$130 additional for each class in the high school, \$4 for each pupil, and \$50 for library and apparatus. Each school with a collegiate department receives a fixed grant of \$450, with additional grants as provided for schools with high school departments; collegiate institutes receive annually a fixed grant of \$500, a grant of \$130 for each department, a matriculation grant of \$300, a grant of \$300 for a satisfactory course for first-class certificates, \$5 for each collegiate pupil, \$100 for library and apparatus, and \$150 each for music and drawing. These grants are in addition to the amounts to which the schools are entitled as public

or elementary schools. Grants are made for manual training and domestic science, for equipment, and for salaries. Local authorities have power to raise all moneys required to support the schools not provided by the Provincial Treasurer, but partly by the municipalities and partly by the individual districts. The Department of Education conducts the Normal and Model schools for training teachers. A school for the deaf and dumb is under the Department of Public Works. Manitoba has a State-aided university, an agricultural college, and reformatories for boys and girls. The schools are non-sectarian, but trustees have authority to have religious exercises after 3.30 p.m.; but pupils are not required to remain for these exercises. Trustees have authority to employ medical officers and nurses in the schools.

New Brunswick. The schools of New Brunswick are under the direction of a Provincial Board of Education, consisting of the Lieutenant-Governor, the members of the Provincial Government, the Chancellor of the University, and the Chief Superintendent of Education. The Chief Superintendent is secretary and chief executive officer. He supervises and directs the inspectors, directs the enforcement of the Schools Act, and the Board of Education regulations, and apportions the school fund of the Government. He is *ex-officio* President of the Senate of the University of New Brunswick. The province is divided into school districts, each electing a board of local trustees. In rural districts, there are three trustees; in cities, there are nine, except in St. John, which has eleven. The Lieutenant-Governor in Council appoints a minority of the members in cities; the majority is elected, and two members in each city may be women. The Provincial Treasurer pays grants to teachers as follows: Elementary schools—women from \$63 to \$80, and men from \$81 to \$100 per annum; superior schools—from \$250 to \$275 per annum; grammar schools—from \$350 to \$400. An equal amount at least must always be paid by the trustees. Special grants are made to poor districts; and where the pupils have to be driven to school, the Provincial Treasurer may pay one half this expense. Grants amounting to one half the cost are paid for equipment and material. Teachers who teach manual training in addition to other subjects receive a special grant of \$50 per annum, and teachers devoting their whole time to manual training receive \$200. A grant of \$20 per annum is made for a school garden, and a specially trained teacher gets a grant of \$30. Travelling allowances are paid to those attending the Normal school; and \$50 for women and \$75 for men are paid to teachers who take a course of three months' training at the Agricultural College in Guelph, Ontario. Each county in the province must raise annually a sum equal to 33 cents for each inhabitant in the county. This county grant is divided among the rural districts, the cities, and the towns proportionally. The parish is the district unit in New Brunswick. The province has a provincial university and provincial Normal school. The Government and the counties co-operate in bearing the expense of educating the blind and the deaf. The schools are non-sectarian, but schools may be opened and closed with Scripture reading and the Lord's Prayer. Attendance at these exercises, however, is optional. The school law provides that trustees may employ medical officers and take other necessary steps to provide for the physical well-being of the pupils.

Nova Scotia. The educational system of Nova

Scotia is directed by the Provincial Executive Council or Cabinet. No special member of the Government is Minister of Education. The secretary and chief executive officer of the schools is the Superintendent of Education, who is appointed by the Lieutenant-Governor in Council. His duties are practically the same as the duties of the Ministers of Education in most of the provinces of Canada. He is directly responsible to the Government, but does not retire when there is a change of Government; he directs the work of the twelve inspectors, the county academies, high schools, public schools, model schools, and all educational institutions receiving provincial grants. The Normal College is under his supervision; he personally inspects it and the county academies. The Superintendent of Education is assisted by an Advisory Board, consisting of seven members, five of whom are chosen by the Governor-in-Council and two are elected by the licensed teachers of the province. Members of the Advisory Board hold office for two years, but may be re-appointed or elected. The province is divided into 33 school districts, with 7 school commissioners in each, who represent the Provincial Council in organizing and re-arranging school sections, and in deciding, in conjunction with the inspector, as to special grants for poor sections. The inspector is the official secretary of the School Commissioners. Nova Scotia has a comprehensive system of co-operation between the Government, the city of Halifax, and the incorporated towns of the province. Halifax has a school board of 12 commissioners: 6 appointed by the city council and 6 by the Government; and incorporated towns have each a board of 5 commissioners: 2 appointed by the Government and 3 by the town council. A school in Nova Scotia means a class in one schoolroom taught by one teacher; a school of twelve rooms is reported as twelve schools. Elementary schools, high schools, and county academies are all called public schools. Each teacher must hold a professional certificate, and is entitled, after long service or on total disablement, to receive from the Provincial Government an annuity of \$150. Academic teachers may receive from \$300 to \$500. Municipal councils and sectional boards of trustees may add to these annuities. Teachers are not required to contribute to the pension fund. The Provincial Government contributes to the salaries of teachers annually from \$60 to \$210, the amount varying according to the qualification of the teachers. Extra grants are paid to teachers who have taken special training in rural science and secured a diploma. There are 18 county academies in Nova Scotia, and the Government gives \$10,000 annually in grants to them. The Executive Council approves of the consolidation of several small school sections into one. It makes large grants to aid such consolidation, and assists to pay the expense of driving children to consolidated schools and home again. There are 32 manual training centres in the province, to each of which the Government gives an annual grant exceeding \$600. There is a special superintendent of technical and industrial education. Domestic science is taught to girls in each centre. Night schools are conducted for education in the ordinary school subjects, and for training in manual and industrial work, and adults may be admitted. The expenses of conducting the schools are met from Government grants, municipal grants, and district or section grants. There are a few Roman Catholic schools, and their buildings are

owned by the Church and rented by the trustees of the section. No denominational teaching is allowed in the other schools, but opening and closing devotional exercises are permissible. Medical inspection has been introduced into Halifax and the leading towns. There are good institutions in Halifax for training the blind, and the deaf and dumb; the Government pays \$100 per annum for each child at these institutions.

Ontario. The head of the Education Department is the Minister of Education, who is a member of the Provincial Government. He is assisted by two chief officers, a Deputy-Minister of Education and a Superintendent of Education. Under these are a chief inspector, an inspector of technical schools, and of continuation schools (*i.e.* an advanced public school in which high school work is done). The schools are primarily divided into public schools, high schools, and collegiate institutes. Public schools are elementary schools. Separate schools are allowed in Ontario, and in the larger cities there are a considerable number of separate Roman Catholic schools. There are no separate schools above the public or elementary grades. The system of training teachers is very thorough; except in new districts, teachers must have been trained in Normal schools. There are seven Normal schools in Ontario, and a few model schools to train teachers for new districts. Ontario was the first province to make the kindergarten an organic part of the national educational system. Ontario has fine systems of technical schools, of manual training for boys, and of domestic science for girls, also industrial schools for the training and reformation of juvenile delinquents. It has a very complete cadet system, voluntary in high, public, and separate schools. The Education Department has charge of Normal schools, model schools, teachers' institutes, school libraries, public libraries, travelling libraries, vacation schools, and of the institutions for the blind and the deaf and dumb. The Minister of Education has authority to make regulations for (a) the government of the schools; (b) prescribing courses of study; (c) authorizing text-books; and (d) general matters relating to the work of the schools. The province is divided into school sections in the rural districts, each governed by an elective board of trustees. Inspectors in rural districts are appointed by the county councils, but subject to the Department of Education; city inspectors are appointed by the cities themselves, and directed mainly by the school boards appointing them. They are responsible to the Education Department for making reports as required, and for seeing that the provincial regulations are carried out. The expense of maintaining the schools is borne chiefly by local taxation, supplemented by grants from the Government and from the counties. Liberal grants are made to the schools by the Government and by the counties for the payment of teachers' salaries. Special grants are made to encourage school boards to engage teachers with higher certificates, and for providing better accommodation and equipment. Rural school boards receive larger grants in proportion to the salaries paid to teachers. These grants are made with a view to securing better salaries for teachers, and making the teacher's profession a life work, and not merely a stepping-stone to some other profession. Very liberal grants are made by the Department of Education in favour of continuation schools, high schools, collegiate institutes, model schools, and to faculties of education in

universities. Manual training and domestic science receive special encouragement. The whole cost of equipment in a manual training or domestic science centre is paid up to \$1,000 in four successive years, 25 per cent. each year, and 25 per cent. of the cost of renewals. Liberal grants are also made towards the salaries of teachers in manual training and domestic science centres. The teaching of agriculture receives special attention. School gardens are encouraged by very substantial grants in connection with public and separate schools. About \$25,000 per annum are paid for the teaching of agriculture in high schools and continuation schools. At the Agricultural College, special courses are provided for teachers in elementary agriculture and horticulture. Night schools to teach English to foreigners, and technical and vocational work, are encouraged by large grants. Every public school is opened with Scripture reading and the Lord's Prayer. A clergyman of any denomination may use the schoolhouse once a week for denominational religious instruction to children whose parents so desire, after the regular school hours. In Separate schools, the trustees of individual schools have authority to decide the nature of, and time devoted to, the religious exercises. A most efficient system of medical and dental inspection has been established in the leading cities.

Prince Edward Island. A Board of Education, consisting of the members of the Government, the Principal of the Prince of Wales's College, and the Chief Superintendent of Education directs the work of education in the island. The superintendent is secretary and chief executive officer, under whom are four inspectors. The island is divided into local school districts, each managed by a board of trustees elected by ratepayers only. The teacher is the unit on which Government grants are made to the local school districts. Teachers are divided into three classes: First, second, and third. The provincial grants are as follows: (a) First class—men, \$300; women, \$230. (b) Second class—men, \$225; women, \$180. (c) Third class—men, \$180; women, \$130. The Government pays the cost of inspection and examinations and the salaries of the teachers in the Prince of Wales's College, and a Normal school is conducted in connection therewith. Agricultural education is conducted by the Department of Agriculture. Blind, and deaf and dumb children are sent to Halifax institutions at Government expense. A retiring allowance of \$150 per annum is given to teachers who have taught forty years. The Bible must be read in schools, without explanation or comment, to those whose parents desire it.

Quebec. There is no Minister of the Government on the Council of Public Instruction in Quebec. The Superintendent of Public Instruction is *ex-officio* president of the Council of Public Instruction. The Council meets as a single body in considering questions that affect both Roman Catholics and Protestants, but it is divided into two committees: a Roman Catholic, and a Protestant, Committee. The Roman Catholic Committee is composed of the bishops and administrators of the Roman Catholic dioceses and Apostolic Vicariates in Quebec (*ex-officio* members) and an equal number of Roman Catholic laymen, who are appointed by the Lieutenant-Governor in Council. The Protestant Committee is composed of a number of members equal to the number of lay members on the Roman Catholic Committee, and is appointed by the

Lieutenant-Governor in Council. The two committees united constitute the Council of Public Instruction. Each committee has additional members who are not members of the Council. The Lieutenant-Governor in Council appoints four Roman Catholic teachers on the Roman Catholic Committee; and the Protestant Committee may choose six members from denominations that are not Roman Catholic. The Protestant teachers elect a representative on the Protestant Committee. The Superintendent of Education is *ex-officio* a member of each committee, but he votes only on the committee of the religious belief to which he belongs. The secretaries of the two committees are the executive administrators under the Superintendent, who is appointed by the Lieutenant-Governor in Council. There are 39 French and 11 English inspectors. The inspectors are appointed by the Lieutenant-Governor in Council. The Superintendent of Education has authority under the Government to establish a comprehensive list of educational institutions, in addition to ordinary elementary and secondary schools; and he may found and assist art, literary, or scientific societies, museums, picture galleries, and schools for adults. The commissioners or trustees are elected in local school districts by ratepayers only. In mixed communities, the French and English districts need not be co-terminous, but may be arranged so as best to accommodate both the English and the French residents. The chief Government grants are (a) the grant for public or elementary schools; and (b) a superior education fund for universities, colleges, seminaries, academies, high schools, normal schools, and other educational institutions above the elementary schools; \$150,000 are granted each year in aid of education in poor districts, and in improving the condition of elementary and model school teachers. Special grants are made to support the institutions for the blind, and the deaf and dumb, and for night schools. Technical and industrial schools, and commercial education, receive grants from the Council of Public Instruction; and the Department of Agriculture aids the Agricultural College. The higher educational institutions in the Province of Quebec have received large gifts and private bequests. McDonald College, near Montreal, is the gift of Sir William McDonald, who also very liberally endowed McGill University. It is a combined Agricultural College and Normal School for training teachers and teaching scientific agriculture, and is one of the finest institutions of its kind in the world. The balance of the money required, in addition to the provincial grants for the support of education, is raised in two ways: by fees and local taxation. The schools in Montreal city are free, no fees being charged. The Protestant schools are non-sectarian. In Roman Catholic schools the religious exercises are directed by the local priest.

Saskatchewan. The educational work of Saskatchewan is under the direction of a Minister of Education, who is a member of the provincial Cabinet. The chief administrative officer is the Deputy-Minister. The Minister of Education has an advisory educational council composed of five members, two of whom must be Roman Catholics. It is appointed by the Lieutenant-Governor in Council. The Department of Education directs the work of all the schools of the province, kindergarten schools, public and separate schools, high schools, and collegiate institutes. Saskatchewan has an excellent Normal school and a good university.



Photo by F. Froth & Co

Cambridge, Trinity College, Great Court

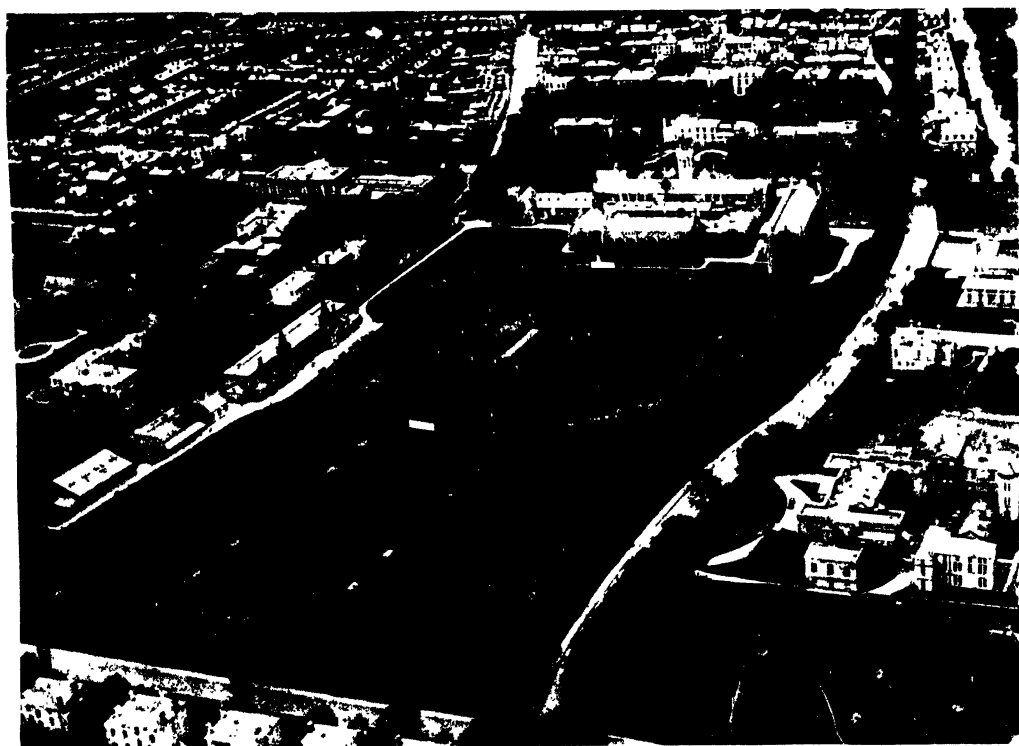


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Air Photo of Cheltenham College

Agricultural education is directed by the Department of Agriculture. The province is divided into local school districts, which are managed by boards of trustees elected by the ratepayers of the districts. Both Protestants and Roman Catholics have the right to establish separate schools, and have their taxes paid to support the separate school. Separate school supporters elect their own trustees, but the number of such schools is relatively small. The grants from the Province for elementary schools are paid on the basis of the number of schools in a district. For this purpose, a "school" means one room in charge of a separate teacher. Secondary education grants are based partly on attendance and partly on the number of teachers. The grants to schools in towns are based partly on the length of time the schools are kept open and partly on the certificate held by the teacher. Liberal grants are made to secondary schools. The cost of the schools beyond the amount received from the Government is raised by local taxation; slight fees may be charged for kindergarten classes, education above the eighth grade, night classes, high schools, and for collegiate institutes. The Province has not yet established schools for the blind, or for the deaf and dumb, but the Government makes provision for them in institutions in other provinces. Attendance at school is compulsory. Trustee boards have authority to direct that the schools in their district may be opened with the Lord's Prayer; also during the last half-hour of each day the trustees may permit religious instruction, but attendance at such school classes is not compulsory.

J. L. H.

CANADA, TEACHERS IN.—In Canada, teachers may not teach without a licence from the Provincial Department of Education, and in general this statement is true, so far as the recognized public schools are concerned, whether the teacher receives a salary or not.

The Provinces have adopted different schemes for regulating the grading of teachers, but in general there are three grades of competency. That is to say, excluding the holder of a "licence to teach," and excluding students in training, there are in most Provinces three grades of certificated teacher. These grades are distinguished in some cases by different examinations qualifying for promotion, just as in England the ex-pupil teacher and the certificated teacher are distinguished; and sometimes the distinction is made according to the marks obtained in the qualifying examination, as in English universities candidates are classified into first, second, and third class.

Teachers are engaged by school boards, who determine the salaries. The Provincial Education Departments point out to local authorities the advisability of paying adequate salaries, and as a rule the Province pays to the local authority a definite grant toward the salary, usually calculated according to the qualification of the teacher. In some cases, the grant depends also upon the inspector's estimate of the efficiency of the school, in order that the grade of certificate may not carry undue weight; but as, in many cases, the certificate does not become "permanent" until the teacher has had two years' successful experience, it is evident that the provincial authorities try to ensure that the certificate means more than mere examination success.

The average salaries of the most highly qualified teachers, who are usually employed in the secondary

schools, are about £300 per annum for men, and about £230 per annum for women. The average salaries of those holding the lowest grade of certificate are about £100 for men and £80 for women. Salaries appear to be rising, and the qualifications of the teachers are improving also.

Most of the Provinces have superannuation schemes, which are on a non-contributory basis. Pensions are to be earned by serving in the Province for a specified number of years, and by attaining a specified age (*e.g.* 60 years in the case of a man, 55 in the case of a woman).

Certain districts of Canada are bi-lingual. In these districts the teachers must, of course, be bi-lingual. Quebec is distinguished by an interesting feature, which has not an exact parallel elsewhere: there are two sets of regulations, one applying to Roman Catholic schools, the other applying to Protestant schools.

A very definite and systematic attempt is being made to adapt the educational system to the industrial needs of the country. Canada is chiefly agricultural. Many of her schools are rural. Special efforts have, therefore, been made during the last few years, and with conspicuous success, to develop agricultural colleges and schools, and summer courses for teachers in Nature Study, Horticulture, and Agriculture.

If in a district ten teachers ask for a special course of lectures on a professional topic, the inspector in that district must provide such a course. A law to this effect has been adopted by several Provinces. It is, therefore, evident that in Canada an attempt has been made to ensure that solidarity between the teachers and the Provincial Department of Education which is the surest guarantee of effectiveness in the teaching. It speaks well for all types of teachers in Canada that the average attendance of teachers, and the value of the work they do at the special courses arranged for them, is really good.

A. C. C.

CANE WEAVING.—(See BASKET-WORK, THE TEACHING OF; TEXTILE WORK IN SCHOOLS)

CANON LAW AND EDUCATION.—The canon law runs through the whole of the history of English education as a permanent influence. To it we owe our system of parochial and episcopal control of education. The parish school of to-day, despite the fact that it is now largely under the control of purely lay authorities, is the direct descendant of a school system entirely controlled by canon law. The canon law as promulgated by Bishop Theodolf of Orleans at the end of the eighth century, in the period when Charlemagne and the English Alcuin were organizing education in France and Burgundy, was the origin of the parochial system. This system was generally adopted by canon law in England at the instance of Aelfric, Archbishop of Canterbury, at the end of the tenth century, though long before that date it was certainly the practice for the Mass-thane or parish priest to have a school at his house. But it has also to be remembered that the canon law in this respect was built on the old Roman practice. The Romans had what were practically parochial schools, such as the little school at Comum founded by the younger Pliny.

The Influence of the Popes. But larger areas were in view, earlier even than the definite introduction of the parochial system. In 747, by the Council of Cloveshoo (Canon 7), abbots and abbesses were

directed to foster education, and in 826 came the policy laid down by that great Pope Eugenius II, who sat in the seat of St. Peter from 824 to 827. He was, says Platina, remarkable for his "sanctity, learning, humanity, and eloquence. . . . He supported the lives and defended the cause of the poor, the fatherless and the widow, in such a manner that he deservedly gained the name of the Father of the Poor." This remarkable Pope, in 826, promulgated certain canons that were settled at the Concilium Romanum. Canon 34 is entitled "de scholis reparandis pro studio literarum," and runs as follows: "de quibusdam locis ad nos refertur, non magistros, neque curam inveniri pro studio literarum. Idcirco in universis episcopis subjectisque plebibus, et aliis locis in quibus necessitas occurrent, omnino cura et diligentia habeantur, ut magistri et doctores constituantur; qui studia literarum, liberaliumque artium ac sancta habentis dogmata, assidue doceant, quia in his maxime divina manifestantur atque declarantur mandata" (*Sacrosancta Concilia*, Vol. VIII, col. 112).

This striking canon, which conceived not only for the Catholic world but also for alien peoples, a broad system of humanistic education, lies behind all subsequent developments in both university and grammar education. It is built on old Roman conceptions of large municipal educational areas, such as the Edict of the Emperor Gratian in 376 describes. From this time forward we find a growing episcopal or monastic control of education, but we also find direct papal intervention in the interests of national systems of education as well as of the schools of particular parishes or dioceses.

English Local Enactments. We have a series of English local educational canons. Thus we have a canon of King Ethelstan (926) that directed the clergy to be proficient in learning. It was necessary to have trained teachers. Again, Canon 51 of the reign of King Edgar (960) directs the parish priest that he must "diligently instruct the youth and dispose them to trades." This is our first reference to technical education. It is from this source that our Church builders found their local masons and artists in stone. By a canon of the same year (X) it was enacted that "no priest receive a scholar without the leave of the other by whom he was formerly retained." There was to be no wandering from school to school. An earlier canon than all these, one promulgated by Egbert, Archbishop of York, in 750, regulated the physical punishment of school boys, and this canon can be traced back to an earlier Welsh enactment which itself is probably a surviving trace of education in England in the Roman period.

Developments after the Conquest. After the Conquest, English education passed under the control of scholars from Lorraine and Normandy, and before the end of the eleventh century we find the episcopal system of control in the highest form of organization with a *magister scholarum* in each diocese or monastic area. In the year 1138 we have a canon promulgated at Westminster forbidding schoolmasters to hire out their schools to other teachers. It is a curious provision, and was probably designed to keep the parish priest in his place as the teacher of the parish. Canon 8 of the Council of Westminster of the year 1200 provided that no charge should be made for the granting of licenses to schoolmasters. This canon was undoubtedly passed as a result of an injunction on the subject made by Pope Alexander III (1159-1181) to the

Bishop of Winchester. The text of this remarkable letter is to be found in the *Decretales Gregorii IX* (Lib. v, Tit. 5, cap. ii). It directs the bishop (Henry de Blois, grandson of William the Conqueror, the greatest English ecclesiastic of that age) to see that no charges are made for licences to teach: "freely thou hast received, freely give." Prudent, honest, and discreet men were to be appointed as teachers. Alexander had indeed the interests of education at heart, and, in the Third Council of Lateran, c. 18 (1179), he dealt generally with the same important subject for the whole Catholic world. This question is one that needs to be very closely considered by students of the history of European education. In 1170 the Pope had legislated for the Gallican Church on the subject: "pro licentia docendi pecunia exigi non debet, etiamsi hoc habeat consuetudo." In 1215 the Fourth Council of Lateran provided that there should be a schoolmaster in every cathedral, and that he should be licensed by the bishop. Further legislation on this subject followed in the Council of Vienne (1311). It would be possible to trace later instances of Church intervention on a universal or a local scale. It is, however, sufficient here to have indicated the broad lines adopted by the Church and the important consequences that have sprung from the efforts of great popes and bishops in the Middle Ages.

J. E. G. DE M

CANTERBURY COLLEGE (N.Z.).—(See NEW ZEALAND, EDUCATION IN.)

CANTERBURY, KING'S SCHOOL.—It is claimed that this venerable school was founded in the year 620, its origin reaching back almost to the days of Ethelbert, King of Kent, St. Augustine, and the Conversion of England. It was distinctly the Archbishop's school, attached to the cathedral, and managed by the Dean and Chapter, until it was re-founded in 1541 by Henry VIII, when it received its new name. There was no solution of continuity, however, in its history; the last master of the Archbishop's School, named Twyne, was retained in his office and became the first Master of the King's School.

Among its many distinguished pupils may be mentioned Christopher Marlowe, Dr. William Harvey, and "David Copperfield." The chief buildings are ranged round a quadrangle called the Mint Yard, and the gateway bears the date 1545. There still remains a fine Norman staircase leading up to the schoolroom, and there are other early remains, notably a beautiful fifteenth-century room over the Precincts Gate. The Green Court, a grass close facing the Deanery, is used for cricket practice; but there are other regular playing-fields, and matches are played on the County Cricket Ground.

On Sundays and Saints' Days the boys attend the cathedral Matins, and on Sunday afternoons a service is held in one of the chapels of the cathedral reserved as a school chapel.

There are, in five houses, about 250 boys, sixty or seventy of them belonging to the Junior or Preparatory School and occupying their own quarters. The Senior School is not divided into "sides," but a good deal of specialization is permitted; there are Army, Navy, and engineering classes. From 25 to 30 entrance scholarships are awarded annually, ranging from £10 to £55; 2 leaving exhibitions of £50 for three or four years usually fall vacant every year; and "gifts" from

old bequests and new foundations are also made to deserving boys who are proceeding to the university, Sandhurst, Woolwich, etc.

CAPE OF GOOD HOPE, THE UNIVERSITY OF.—(See SOUTH AFRICA, THE EDUCATIONAL SYSTEM OF.)

CAPE PROVINCE, EDUCATION IN.—(See SOUTH AFRICA, THE EDUCATIONAL SYSTEM OF.)

CAPELLA, MARTIANUS.—(See ARTS, THE SEVEN LIBERAL.)

CARDAN, JEROME (1501–1576).—A famous Italian scholar of Pavia and Padua. He was professor of mathematics at Milan, but also practised medicine and wrote works on philosophy and natural science. In *De Subtilitate Rerum* and *De Rerum Varietate*, he propounded his views on physics and metaphysics; and his works display remarkable depth of intellect and sound conception of scientific principles. From 1571 to 1576 he lived in Rome, and wrote his autobiography, *De Propria Vita*. Text-books on algebra give the name of "Cardan's Solution" to a method of solving cubic equations, which he published in his *Ars Magna* (1525), and which he obtained from Tartaglia. The method had been invented by Scipio Ferreo about 1505.

CARDBOARD MODELLING, THE TEACHING OF.—A beginning can be made in the Infant School with exercises which consist in folding thin paper. No tools are necessary, the paper being supplied to the pupils ready cut to size. If any fastening needs to be done, recourse may be had to string, pins, or paste. Another direction in which work may be pursued is the free-cutting of objects in coloured paper (*e.g.* animals, ships, etc.), and pasting them on a background to form pictures, or arranging them to constitute tableaux.

In the lower classes of the Senior School, as soon as children are able to use ruler and set-square, they should draw and cut to size their own materials. Carton paper, about the thickness of ordinary drawing paper, will be used at this stage. The only tools needed will be ruler, set-square, and scissors. Some preliminary practice in cutting straight lines with scissors can be got by cutting leaves of exercise books into strips along the ruled lines. These strips need not be wasted, but can be used in the building of letters, or cut into small counters for concrete arithmetical work. Lines along which paper is to be folded must first be creased, or "scored." The pencil will suffice for this if it is an "H."

At about the age of nine, children will be able to manipulate stiffer material, of about the thickness of a post-card. Cutting will still be done with scissors, and scoring with the back of the scissor-point. Somewhat thicker card may next be introduced, along with knife, metal straight-edge, and cutting pad. Millboard is the most convenient material for the last named. Work in thicker cardboard and cloth will be undertaken as proficiency is attained; but some exercises in upper classes will, of course, still involve the use of thin material.

General Principles. Broadly speaking, the work should conform to the following general rules—

1. Employ few tools, so as to allow the maximum use of the fingers.

2. Except in the earliest stages, do not let the

work be dominated by the "model"; many exercises which do not involve making a model must find a place (*e.g.* concrete work in fractions by using strips of paper).

3. The work should be basic. The ideal exercise is that in which the child can be guided to discover something for himself.

4. Models should be wholes, rather than parts (*e.g.* do not make a cardboard wheel and let the matter rest there, but make the complete vehicle).

5. Group as many exercises as possible round a common centre (*e.g.* a doll's house and furniture may form such a series).

6. Freely incorporate other media (*e.g.* bits of thin wood will supply shafts for a cart, a paper-fastener will do for the knob of a door, a bit of wire makes a handle for a pail, etc.).

7. Let the pupils make as much apparatus as possible for school use (*e.g.* cardboard rules, set-squares, protractors; crayon boxes; paper scales for scale-drawing and map-measuring; pint measures; note-books).

8. Models should be as concrete as possible (*e.g.* a cube as such has little interest to a young child; but change the exercise to a cubical money-box, and it becomes alive with interest).

9. Some toys should find room in every scheme. No matter how rude in conception and rough in execution, they are ever a source of untold satisfaction to the young maker; and what the toy lacks in material completeness is always supplied by the child's own vivid imagination.

Method and Materials. As to method in particular, generally avoid giving the child a detailed dimensioned drawing to work from; the more suitable way is to give him an object to handle, analyse, or take to pieces, and from first-hand information thus acquired, to plan out the method of construction for himself. If the child fails, no great disaster has happened: on the contrary, the child has done at least a little original thinking, which, after all, is the essence of this and of every other educational matter.

A word concerning materials. Zinc cutting planes should be avoided; they take the edge off knives. The best all-round adhesive is Higgins's Vegetable Glue. The Non-Slip Safety Rule (an accurate metal rule and straight-edge in one) is superior to all others on the market. Use hard pencils. Knives should have thin blades and penknife-shaped points; a finger-rest on the back of the blade is an encumbrance rather than a help. In general, such tools as bone folders and scoring nibs can be dispensed with.

F. T. K.

CARLYLE, THOMAS (1795–1881).—The son of a stonemason, Carlyle was born at Ecclefechan in Dumfriesshire. After education in his native village and at Annan Academy, he spent four years at Edinburgh University (1809–1814). He then engaged in teaching at Annan and Kirkcaldy; but went to Edinburgh in 1818, and in 1822 was tutor to Charles and Arthur Buller. For some years Carlyle had studied German literature closely, and among his earliest works were a *Life of Schiller* and *Wilhelm Meister's Apprenticeship* (1823–1824). From this time, Carlyle devoted himself entirely to literature, and contributed many articles to the leading reviews of the time. *Sartor Resartus*, a fantastic "philosophy of clothes," appeared in *Fraser's Magazine* in 1833–1834, but did not become popular. In 1834, Carlyle came to London,

and settled in No. 5 Cheyne Row, Chelsea, where he wrote his *French Revolution* in a style which is entirely his own, and has never been successfully imitated. He lectured on German literature and other subjects, and his *Heroes and Hero-worship* has become a classic. He published *Past and Present* in 1843 and *Cromwell's Life and Letters* in 1845. His last great work was a *Life of Frederick the Great*, published at intervals between 1858 and 1865. In 1865, Carlyle was elected Lord Rector of Edinburgh University. From this time till his death, he produced no work of great importance. Carlyle was an historian and a biographer; hence his greatest works are professedly historical, and most of his essays are historical or biographical. His writings comprise "the most brilliant, the most stimulating, the most varied, and the most original work in English literature" (Prof. Saintsbury).

CARMARTHEN TRAINING COLLEGE.—The interest taken by the National Society in Welsh education led it to form a special Welsh Sub-Committee and to collect funds for building Welsh elementary schools. The need for teachers caused the Church Union Society to build model schools in South Wales; and the Welsh Sub-Committee, in 1848, decided to build a training college in Carmarthen. It was opened in 1848, and contained a schoolroom and a library, with accommodation for sixty residential pupils. This soon proved inadequate, and additional classrooms, bedrooms, workshops, a gymnasium, and a laboratory have since been provided. The College is for men only, and the number of students in residence is about sixty.

CARMELITES AND EDUCATION.—(See MENDICANT ORDERS DURING THE MIDDLE AGES, EDUCATION IN.)

CARNEGIE DUNFERMLINE TRUST, THE.—The Carnegie Dunfermline Trust was constituted in August, 1903, when Mr. Andrew Carnegie invited fifteen representative citizens of his native town to visit him at Skibo Castle, Dornoch, and there requested them to undertake the trusteeship of 2,500,000 dollars (in 5 per cent. bonds of the United States Steel Corporation), bringing an annual revenue of £25,000.

In 1911, Mr. Carnegie increased his gift by 1,250,000 dollars in the same bonds, thus giving the trustees a total annual income of £37,500. This was to be spent, not in relieving Dunfermline of its statutory responsibilities, but in pioneer efforts to give to her citizens, "especially the young, some charm, some happiness, some elevating conditions of life which residence elsewhere would have denied; that the child of my native town, looking back in after years, however far from home it may have roamed, will feel that simply by virtue of being such, life has been made happier and better." The aim of the Trustees (Mr. Carnegie wrote) was to find "what can be done in towns for the benefit of the masses by money in the hands of the most public-spirited citizens."

Constitution. The Trust consists of twenty-five members. The fifteen gentlemen already referred to became Life Trustees, with power to select their successors. Recognizing the novelty and difficulty of their duties, Mr. Carnegie appointed Dr. John Ross first Chairman of the Trustees, believing him to be "specially designed for this very work,

original though it be." The Vice-Chairman is Sir William Robertson. Six representatives are appointed by the Town Council and three by the "Education Authority of the Burgh for the time being."

Relation to Other Trusts. The Trust was the forerunner of other beneficent organizations in the United Kingdom created by Mr. Carnegie, differing in their immediate aim, but all essentially contributing to the highest welfare of humanity and managed by trustees—

The Carnegie Universities Trust created in 1903; the Carnegie Hero Fund Trust, created in October, 1908; and the Carnegie United Kingdom Trust, created in October, 1913.

Work of the Trust. When the Trustees commenced their administration, they found a natural point of departure in Mr. Carnegie's earlier gifts to Dunfermline: the Library, built in 1881; the Old Baths, gifted in 1877; the New Baths and Gymnasium; Pittencrieff Park and Glen, which he had previously handed over to the Trustees. These gifts turned the attention of the Trustees not only to the more direct methods of educating the bodies and minds of their fellows, but to those more subtle means of influencing character which act unconsciously through the wise use of leisure. The Library, now greatly enlarged, was the forerunner of five District Institutes in different quarters of the town: these provide branch libraries, reading and recreation rooms, and bowling-greens. There are also School Libraries and School Reading Circles. From the Baths and Gymnasium have sprung a thorough system of physical training in the schools; the development of outdoor games in ground provided by the Trust; a College of Hygiene and Physical Education; and a pioneer scheme for the medical inspection and treatment of school children, which has fostered the growth of school medical work all over Scotland.

The provision of open-air music in the Pittencrieff Park and Glen was followed by the institution of a School of Music; the gardens suggested school gardens, and promoted a love of flowers. Along with these developments there arose an Art and Craft School for adults, and an Art Master has been appointed for the schools.

In 1912 an Institute for Women was opened, where classes in Cookery, Home Nursing, Embroidery, and other domestic arts are held, and friendly intercourse cultivated. A. MACKENZIE.

CARPENTER, MARY (1807-1877).—Daughter of Lant Carpenter, LL.D., a celebrated Unitarian divine, and schoolmaster of Exeter and Bristol. She assisted her father in his school, and afterwards established a girls' school at Bristol. In 1833, the Rajah Rammohun Roy, leader of the Monotheistic movement in India, visited Lant Carpenter, and died in Bristol. His acquaintance with Mary Carpenter led her to turn her thoughts to India, and also to the poor and ragged children in England. In 1846 she opened a ragged school in one of the poorest parts of Bristol; and, a few years later, purchased surrounding property, improved it, and laid out a playground. She agitated for the establishment of reformatory schools for young criminals; gave evidence on the subject before a Parliamentary Committee; opened a reformatory school at Bristol in 1852; and was instrumental in securing a Youthful Offenders' Act (1854), which put reformatory schools on a legal footing. She opened a

second school of this kind in 1854; and after her efforts had obtained the Industrial Schools Act (1857), she established a certified industrial school in 1859. In 1866 she visited India and advised the Bombay Government on education and prison discipline. In 1872, as a guest of the Princess Alice, she attended a Congress at Darmstadt on Women's Work; and, in 1873, visited the United States and Canada in connection with reformatory work. Her chief publications consist of reports and views on ragged schools, reformatory schools, and juvenile delinquents.

CARPENTIER, PIERRE (1697–1767).—A famous antiquarian and archaeologist who belonged to the Benedictine Order of St. Maur, at Rheims. In 1720 he began a new edition of Tertullian, and worked with Maur d'Antine on a new edition of the *Glossary of du Cange*. He afterwards lived many years in Paris in order to pursue his literary labours. His chief works are *Glossarium ad Scriptores* (1733–1736), to which he contributed sixteen of the letters of the alphabet; *Literary History* of the congregation of St. Maur (1750); a *New Glossary* of the Scriptures in alphabetical order, with both French and Latin words (1766), a very comprehensive work containing information about authors, manuscripts, and authorities connected with the many editions of the Scriptures; and an *Alphabetum* for the young, with notes on ecclesiastical history (1747). His promised edition of Tertullian never appeared.

CARTER, ELIZABETH.—(See "BLUE-STOCKINGS" AND EDUCATION, THE.)

CARTESIAN GEOMETRY.—(See GEOMETRY, THE TEACHING OF CARTESIAN.)

CARTON WORK.—(See CARDBOARD MODELING, THE TEACHING OF.)

CASAUBON, ISAAC (1559–1614).—Was a member of a family belonging to Dauphiné, and was born at Geneva. From an early age, he devoted himself to classical studies, and became one of the most famous classical commentators. He was Professor of Greek at Geneva and, afterwards, at Montpellier; and, in 1598, was appointed Royal Librarian at Paris under Henry IV. After that king was assassinated, Casaubon was obliged to leave Paris on account of his Protestant views; and, on coming to London, obtained employment under James I, who made him an advocate, and afterwards prebendary of Canterbury. The latter office he held for four years, until his death in 1614. Casaubon gained the favour of James I by his reply to the *Annales Ecclesiastici* of Baronius, in which the writer sought to prove that the Catholic Church was identical in form and doctrine with the Christian Church of the first century. His classical works include commentaries on many Greek writers, and show that he had accumulated a vast store of learning. He also wrote treatises on Greek and Latin poetry, and on ecclesiastical liberty. (See also CLASSICAL LEARNING AND CRITICISM.)

CASE METHOD OF INSTRUCTION IN LAW, THE.—The chief original authorities in English Law are the statutes and the reports of decided cases—the quantitative emphasis on the latter. The secondary authorities are the works of legal

authors who, from time to time, and in different fields, have presented legal principles or rules in a comparatively coherent form.

The methods of teaching English (or Anglo-American) law may be described as expository and casuistic. The expository method adopts the law treatise as the basis of the student's education. The student makes a careful study of prescribed books, consults other books, and possibly does a certain amount of work in the investigation of original authorities. He also attends lectures in which the legal principles and rules are stated in a concise form, and illustrated by reference to decided cases. The nature and extent of the reference vary. The lecturer may or may not insist upon a minute study of the leading cases, and may or may not hold classes for the discussion of those cases. The casuistic method, on the other hand, makes the study of the Law Reports the basis of the student's education. Legal treatises are utilized merely for purposes of reference. The lecturer indicates the particular cases which a student is required to study (generally he will adopt as a foundation some published compilation of leading cases on the particular subject-matter with which he is immediately concerned), presides over classes in which the prescribed cases are discussed, and assists the students in the difficult work of co-ordinating the results of their researches. In effect, the students write their own text-book.

The choice between the expository and casuistic methods is apt to vary with the teacher's conception of the relative importance of the different purposes of legal education. According to the writer of this article, the supreme purpose of legal education is to teach the student to *think*—if in the process of learning to think, the student learns a good deal about the law, so much the better. This emphasis on thinking is the result, not of forgetting that a law school has to prepare men for the legal profession, but rather of remembering what the attainment of this object involves. The lawyer has to know a good deal of law; but, as Dr. Johnson said, "We may know a subject ourselves or we may know where to find information about it." The lawyer's knowledge is, in great part, a power to know where and how to seek the rule of law applicable to the case before him. The power implies, of course, a wide reading; but it demands, still more, a mind disciplined in methods of thinking, and especially in those methods of thinking which are involved in the application of law to concrete groups of fact.

Assuming the justice of the remarks just made, the reader will readily appreciate the merits of the case method of instruction. One has only to consider for a moment the mental processes included in the study of a decided case. The student begins with a statement of the facts. He studies the facts in their mutual relations; he proceeds to trace, in the argument of counsel, the application of apparently conflicting principles or precedents; he finds in the judgment of the Court a careful examination of opposing views, and an authoritative statement of the law. Finally, he examines that statement with the object of giving to it something of a more formal character: for the law is to be found in the decision of the Court, not in the language of the judge. Such processes, in the case of students of a law school, are repeated in class in the presence of other students, and under the guidance of a lecturer, with whose assistance the students go

through every step of the judicial process, and examine the precise meaning and scope of the judgment. By such means the rule of law is impressed upon the memory; the underlying principle is grasped; and the mind, disciplined by the experience of high intellectual effort, acquires a new power for future work.

Disciplinary Value. One purpose served by the study of case law must appeal to all true students. Such study offers a school of discipline in the comparative value of arguments. One of the rarest and most useful possessions in life's contest is the power of perceiving the relative value of statements or reasons which may be submitted for acceptance. An ingenious trifter can find arguments. A disciplined mind works upon a mass of such arguments—weighing, selecting, and arranging, until at length things have appeared in their true proportion. The possession of such a mind gives great power, and deserves unwearying pursuit. How shall it be gained? There is no better way for the law student than the study of case law. The report of a decided case is a discipline in the art of discriminating between arguments of varying degrees of subtlety, relevance, and power.

I have, so far, considered the value of the case method as a mental discipline. I doubt if there is a single intellectual faculty of value to the lawyer which such study does not tend to stimulate and strengthen. But even if we concentrate our thought upon the purpose of a knowledge of the law, the case method compares not unfavourably with the expository. "Truth is only known by us in so far as we ourselves make it." The learned treatises on law, so indispensable to the practising lawyer, are apt to be a snare to the student. No one can enter into the results of others' labours without experiencing something of the difficulties with which others have had to contend. A student cannot start where his teachers have left off. His relation towards the results which others have gained cannot be defined in precise terms, for it varies with the subject, and with individual possibilities and needs. But that relation cannot be one of mere acceptance. And, to be something more than mere acceptance, the student must go to the original authorities. When he has done so, he will be in a position to profit by the researches of others. "To give the net product of an inquiry without the inquiry that leads to it," wrote Herbert Spencer, "is found to be both enervating and inefficient. General truths, to be of due and permanent use, must be earned. . . . The mind should be introduced to principles through the medium of examples, and so should be led from the particular to the general—from the concrete to the abstract. Students should be *told* as little as possible, and induced to *discover* as much as possible."

Objections. Despite its indisputable merits, the case method of instruction has not been generally adopted in Law schools within the Empire. The fact is not wholly attributable to the conservatism of law teachers, or to the necessity—which the adoption of the case method would involve—of remoulding the curriculum, and the system of teaching and examination. The case method is open to objections. Three of these objections may be considered together—

1. English law trials have not been conducted with a view to the education of students. The reports of those trials assume a certain knowledge of pre-existing law. "The student who begins a

study of a particular law subject by an investigation of leading cases on that subject, may be courageous. But is he wise?"

2. Art is long and time is fleeting. Since the volume of the Law Reports is immense, it seems fair to assume that a law student who makes use of a learned treatise will acquire a working knowledge of the body of legal rules within a shorter period of time than the student who laboriously frames those rules for himself out of the raw material of the reports.

3. There are learned treatises on English Law which rank as literature. Where such treatises can be found, the law student who works exclusively or mainly on cases is apt to miss something of value on the cultural side of legal studies. The loss will be the greater if, as may be the case, the system of examination lays an excessive emphasis upon the power to apply knowledge, as distinct from the power to express it.

The writer recalls a conversation which he once had with Maitland. That Master, in appreciating an examination paper which the writer had previously set for the Cambridge Law Tripos, remarked: "You must not have too many '*cases*' in your examination paper. That leads to the sacrifice of the literary side of legal education."

The foregoing objections, however, have to be weighed against the many merits of the case method, especially its value as a mental discipline. Moreover, the objections can be met to a large extent by judicious teaching. The writer has always held, though he must confess in opposition to many eminent teachers who employ the case method, that the student of case law should precede his course of study with a preliminary survey both of the elements of law in general and of the principles of legal interpretation. Again, when the student comes to the study of some special subject, the instructor, by his selection of the cases, by occasional exposition, and by references to standard text-books, can do much to economize the student's time and increase the value and efficiency of his work. Again, so far as the cultural side of legal studies is concerned, the case method demands a study of judgments which are among the masterpieces of our legal literature, and does not exclude the use of law treatises. It only requires that law treatises should be employed to supplement and complete the study of the Law Reports, instead of being regarded as a substitute for them. Further, a Law school which employs the case method may include (in the opinion of the writer *should* include) in the curriculum a course of studies in such subjects as Comparative Law, Jurisprudence, and the Theory of Legislation.

Case Method at Harvard. In the writer's opinion, the case method is the ideal way of teaching English or Anglo-American Law. But a long and varied experience of law teaching at different universities has convinced him that the case method, at any rate in its entirety, is not always practicable. He recalls an experience several years back when he had the privilege to attend a class conducted in that home of the case method—the great Law School at Harvard. The class consisted of about 200 students. Despite the size of the class, the discussion held the students' interest from start to finish. The chief reasons appeared to be two—

1. The lecturer was very skilful in handling the class. He knew his subject, of course. But he also knew how to ask questions which were searching,

suggestive, and provocative. He knew in what order to ask his questions. He knew how to lead on discussion so that, *even for the average student of his class*, fundamentals were not lost sight of in the allurements of juridical niceties. He knew how to deal with the difficult student, whether verbose, ignorant, timorous, or over-confident—to deal forcibly and quickly, leading the student on to self-enlightenment, with a tact which left no sting behind.

2. The students were specially qualified to profit by the case method. Before a student could enter the Law school he must have reached a standard of general education approximately represented by not less than second-class honours in an Arts Degree. When he first entered the Law school, he was dealt with in smaller classes. Throughout his academic course, in law clubs and at moot trials, in co-operation with fellow-students and the professors, he was making real advance in the direction of becoming a research student in the best sense of the term. In the lecture referred to, only a small minority of the students spoke. But, so far as the writer could judge, every student was thinking all the time—giving his own answers to questions, criticizing the answers of other students, formulating questions or difficulties in his own mind, very possibly at times criticizing the views of his instructor.

The moral will be apparent. The case method makes great demands upon both teacher and student. Some teachers, who make excellent expositors, would achieve indifferent results under the case method, at any rate, as applied to large classes. Again, in Law schools where the system of examination is wholly distinct from the system of teaching, or where the student is allowed to enter upon law study after a very indifferent general education, or where the coincidence of work in a Law school with practical experience in office or chambers limits the students' time for private study; or where the average student is temperamentally reluctant or intellectually unsuited to undergo the various forms of discipline which are necessary to the attainment of the best results under the case method, the law teacher may be compelled to effect some sort of compromise between the ideal and the practicable. The nature of this compromise will vary according to the conditions, but, in the opinion of the writer, the teacher of law should keep the ideal constantly in view. He should strive to secure the reform of conditions which are hostile to the application of the case method, so far as such reform is possible. In the meanwhile, if he cannot adopt the case method in its entirety, he may at least endeavour to ensure that, grouping the various law subjects together, *not less than half the student's time* is spent in the study of the Law Reports, and *not less than half the lectures* are devoted to class discussion of decided cases. Even this much may sometimes be difficult. But to the writer it represents the minimum with which a School of English or Anglo-American Law should be content. W. J. B.

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CASSIODORUS.—(See ARTS, THE SEVEN LIBERAL.)

CASTE AND EDUCATION.—(See HINDU WOMEN, THE EDUCATION OF.)

CASTELL HYWEL.—(See DAVIS, DAVID.)

CASTELLIO, SEBASTIANUS.—A French humanist, born at St. Martin du Fresne (Ain) in 1515, died at Bâle in 1563; at first, principal of the college at Geneva; then press reviser for the printer Sporin; and, finally, professor at the University of Bâle. He maintained a very energetic controversy against Calvin after the execution of Michael Servetus, and published on that subject, in Latin and in French, several works in which the doctrine of freedom of conscience is set forth with as much thoroughness as it could have been even in our own days (especially in the *De haereticis an sint persequendi* (1554), which he published under the pseudonym of Martinus Bellius, in the *Traité des hérétiques si on les doit persécuter*; and in the *Contra libellum Calvinum*, published posthumously. He maintained boldly the doctrine of mutual respect of creeds, and claimed for all "the right of serving God according to one's own belief, not that of others," in the preface to his Latin Bible, which he addressed to King Edward VI, as well as in his *Conseil à la France dévote* (1562), in which he proposed "that two churches should be allowed to exist in France side by side, as it is wrong to force people's consciences." Thus "a poor printer's reader formulated for all time the great law of tolerance," says Michelet. Certainly, his chief claim to immortality is this education of the conscience.

As professor of the humanities, hellenist, latinist, and professor of the use of French in education, he has left numerous works, the best known of them being his miscellany resembling those of Mosellanus (*q.v.*) and Corderius (*q.v.*): *Dialogorum sacrorum ad linguam simul et mores puerorum formandos libri quatuor* (four books of sacred dialogues, designed for the training of boys in grammar and morals) [1545]. These are scenes from the Old and New Testaments, put in dialogue form, and giving opportunities for that oral use of Latin, that is, of *real* Latin, which the humanists considered to be necessary as a possible instrument in all liberal education. These little dialogues possess another interest: they may be regarded as the manual of religious, moral, and civic instruction of a little sixteenth century Protestant republic, whereby the younger generations were inspired with hatred for tyrants, distrust of the great ones of the earth, rebellion against persecution, and that eternal paradox—the belief that suffering, especially suffering for the sake of justice, is the one and only source of real happiness.

The *Dialogues sacrés* appeared in countless editions; it is to be noted that it was the class-book constantly used in Germany down to the end of the eighteenth century for the elementary teaching of Latin; thus the *praeceptor Germaniae* was a Frenchman unknown in his own country, a man whom Charles Nodier calls the "Fénelon of the Protestants." F. E. B.

CASTIGLIONE, BALDASSORE (1478–1529).—Was the great exponent of the education of the

courtier in the early sixteenth century. His *Cortegiano*, the standard work on the subject in Queen Elizabeth's time, first published at Venice in 1528, was translated into English by Sir Thomas Hoby in 1561. It became an international book, describing the best models of the cultured Italian ducal Courts. Castiglione was brought up in the Court of Mantua, which preserved the tradition of Vittorino's teaching (*qv.*), under Francesco Gonzaga. In 1504, he entered the Court of Guidobaldo di Monte Feltro, Duke of Urbino, which was at its most brilliant time. In 1506, Castiglione was sent to England to acknowledge the honour of the Order of the Garter on the duke by Henry VII. In 1524, he went to Spain on behalf of the Pope. It is said that he had the offer of a Cardinal's hat. He died at Toledo in 1529. Charles V praised him as "one of the best knights in the world." Thus equipped by birth (his mother was herself a Gonzaga of Mantua), by training, and by life-experience, Castiglione wrote a book which breathed of real life by his close description of the very atmosphere of Urbino itself. It demands gracious consideration of others: as, for instance, to speak in the language of the country in which a man is travelling, to understand the point of view of another person, especially of superiors; to be well-spoken; to be good company; with women to be always courteous; and to "love better the beauty of the mind than the body; to worship her with virtuous deeds." It forbids occupations like dice and cards played for money. Modern languages must be known as well as classical languages.

Roger Ascham maintains that Castiglione's book, studied for a year and diligently followed at home in England, would do more for a nobleman's son than three years' travel abroad—for he combines the ideals of learning with knightly, "comely exercises." But its very thoroughness makes it one-sided educationally, in ignoring other types than the courtly. Nevertheless, it is difficult to over-estimate the effect of a great literary idealizing of the chivalric, combined with the scholarly attainments to produce the perfect courtier.

The direct influence of *Il Cortegiano* continued through the sixteenth and seventeenth centuries, as, for instance, is shown in the *Italian Courtesy Books* (Early English Text Society, 1869) in Peacham's *Compleat Gentleman* (1622); but the indirect influences showed themselves still more in the general currents of literature and even in the traditions of social life. F. W.

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CASTING OUT THE NINES.—To "cast out the nines" from a number is to find the remainder when the number is divided by 9. Thus: $745 \div 9 = 82$, and the remainder is 7. The remainder may be found by adding the figures ($7 + 4 + 5$) of the number and dividing their total by 9. The reason is shown as follows—

$745 = 700 + 40 + 5 = (7 \times 99 + 7) + (4 \times 9 + 4) + 5$, which may also be written as—

$$(7 \times 99) + (4 \times 9) + (7 + 4 + 5).$$

Thus the remainder is obtained from $7 + 4 + 5$. The process is used as a check on the accuracy of addition and multiplication results. Thus: $3716 + 2194 + 875 = 6785$. Cast out the nines from the three basal numbers and you obtain $8 + 7 + 2$ (*i.e.* 17); then cast out the nine from 17, which leaves 8; if, therefore, the total is correct and the nines are cast out of it, the remainder must also be 8. This is seen to be the case.

Again, 71463×2195 ; casting out the nines from the factors and multiplying the remainders together gives 3×8 (*i.e.* 24); from this 24, casting out the nines, we get 6. If the product is correct, 6, therefore, will also be the remainder when the nines are cast out of it.

CATALEPSY (or cataleptic rigidity) is a peculiar increase in the normal rigidity or tone of the voluntary muscles, of such a character that the limbs offer only a very slight resistance in passive motion, and also remain in a given position though it may be opposed to gravity. This state may last for an hour or more. Catalepsy frequently occurs in hysteria, insanity, and intoxication caused by anaesthetics. Artificial catalepsy may be produced by hypnotism.

CATARACT.—(See EYESIGHT OF SCHOOL CHILDREN, THE.)

CATARRH.—(See NOSE, THE HYGIENE OF THE)

CATECHETICAL SCHOOLS.—In the work of spreading Christianity among heathens and Jews, the first step was to prepare the converts for baptism; and, even in the earliest infancy of the new church, some instruction was always given to converts before baptism. Theophilus was "instructed" (Luke i. 4) in Gospel history, and Apollos in the "way of the Lord" (Acts xviii. 25). Little is known of any system that was followed during the first two centuries, but by the fourth century the work had been thoroughly organized. The Christian Councils prescribed that candidates for admission to the Church should first present themselves to the bishop or priest, and, if of satisfactory character, they went under instruction. Some, called *Auditores* or *Audientes* (listeners), were allowed to attend in churches and to hear sermons. Others called *Prostrati* or *Genuflectentes* were also allowed to kneel and pray. While under instructions, the converts were known as *Catechumens*, and to them the Catechists explained the articles of the Creed, the nature of the Sacraments, etc. Special inquiries into character were made during the forty days preceding baptism, and this period was one of fasting, watching, and prayer. A few days before baptism the catechumens were taught the Creed and the Lord's Prayer, and their names were inscribed in a church register. There was no regular order of catechists, for it was the part of all the clergy to watch over the souls of those desirous of entering the Church; and thus bishops, priests, and deacons alike acted as catechists. The instruction was often given in the building used for worship, and either before or after service. A room was sometimes used in the priest's house, while in cities like Antioch and Alexandria a lecture room would be used. Such a room is probably intended in the reference to the "school" of Tyrannus (Acts xix. 9). Later in the history of the Church, special buildings were set apart as schools.

The scheme of instruction varied considerably, according to the converts; but it was usually a progress from lower to higher truths. Representative examples are found in Augustine's treatise *De Catechizandis rudibus* and the *Catecheses* of Cyril of Jerusalem. In Augustine's work, sacred history is given from the Creation downwards, and is followed by instruction on the Resurrection and the future Judgment. The more highly educated were instructed in the meaning of the Scriptures and the types of the law. The teaching of Cyril, intended for the later stages of instruction, included the chief articles of what is now known as the Apostles' Creed.

CATECHISMS.—A catechism is a system of instruction arranged in the form of question and answer. Dr. Johnson's definition was "a mode of instruction by asking questions and correcting the answers." The original form of instruction in the Early Church was oral; and Clement of Alexandria wrote that "the catechist delivers knowledge to the ignorant and makes them repeat or *echo* it back again." The verb *κατηχέω* (*katecheo*) in Luke i. 4 is translated "instruct," and in Galatians vi. 6 by "teach."

Formal Catechisms. The introduction of formal catechisms dates from about the ninth century, but it was not till Reformation times that they came into general use. Several of the reforming bodies, including the followers of Wyclif, used catechism as a means of teaching and of spreading their doctrines. Luther compiled his Larger Catechism and Smaller Catechism in 1529, and they became a definite statement of the principles of the Lutheran churches, which use them at the present time. Similarly, Calvin prepared two Geneva catechisms, Larger and Smaller, for use in the Reformed churches which followed his teaching in Switzerland, France, and elsewhere. Calvin's Catechisms were adopted by the Scottish Reformed Church in 1560. About the same time, the Heidelberg Catechism was drawn up in Germany, and subsequently became the standard of the German Reformed Church. A catechism for the Roman Church was compiled as an indirect result of the Council of Trent, and issued under the authority of Pius V (1566). It was not in the form of question and answer, but rather a statement of doctrine for the use of teachers and curates. At the present time, the catechisms adopted by the Roman Catholic Church vary in different countries, and in England the *Penny Catechism* is commonly used.

In the English Church, instruction of this nature commenced immediately after the separation from Rome, but the Church Catechism was not all composed at the same time. It appears from the Injunctions of 1536 and 1538 that the instruction was not systematic, and that the people were very ignorant of even the rudiments of the Christian religion. The clergy were directed to recite every Sunday and holy-day one sentence of the Lord's Prayer, or of the Creed, in English, twice or thrice until the whole was learned. Each sentence was to be explained as it was taught. The Commandments were to be taught in the same way.

The English Church Catechism. In its original form, the English Church Catechism was composed by Dean Nowell, and inserted in the Prayer Book in 1549. In 1552, the Preface to the Ten Commandments was added, and the Commandments themselves, which had previously been

abridged, were now given in full. The explanation of the Sacraments, supposed to be the work of Bishop Overall, was added in 1604. In its earliest form, the catechism was usually called the Shorter Catechism, to distinguish it from Cranmer's Catechism, which was much longer. Previously to 1662, the Catechism was prefixed to the Order for Confirmation, and the bishop was directed to ask questions from it of candidates for confirmation. The 59th Canon directs the clergy to examine and instruct the youth and the ignorant persons of their parishes for half an hour or more on every Sunday; and also "diligently to hear, instruct, and teach them the Catechism set forth in the Book of Common Prayer." The present rubric in the Prayer Book directs clergymen to catechize after the Second Lesson at Evening Prayer, but the injunction is now followed in very few churches.

The Presbyterian Catechism. The rise of the Presbyterians in the reign of Charles I, and their triumph in the Civil War, led to the compilation by the Assembly of Divines at Westminster of two catechisms—Larger and Shorter—which were approved by the English Parliament and the General Assembly of the Church of Scotland. These catechisms have ever since been the standard declaration of faith of the Presbyterian churches in Great Britain and beyond the seas. They have also been adopted to a large extent by some of the later Nonconformist bodies.

Secular Catechisms. The use of catechisms in teaching was also extended to secular subjects, and until very recent times there were many catechisms on such subjects as history and geography. In theology, the value of a catechism is very great, because of the need for definite and authoritative statements of fundamental principles, and because of its influence in forming and fixing religious opinions and doctrines. In other subjects, however, this form of instruction is of very doubtful value; and though, at a time when much teaching consisted of making pupils learn by heart, a catechism was an easy way of providing information, it is now rarely used, because it affords no training of the learner's intelligence. The only argument that can be advanced in favour of a catechism is that it is a means of implanting in the mind a fixed form of words when that particular form is important. As a substitute for oral instruction, however, and for the cultivation of the intellect, a catechism is valueless, and has disappeared from the schools.

CATECHUMENS.—(See CATECHETICAL SCHOOLS.)

CATHEDRAL LIBRARIES.—(See LIBRARIES IN THE SEVENTEENTH CENTURY.)

CATHEDRAL SCHOOLS.—In the first half of the nineteenth century, it could be said that every cathedral in England and Wales maintained a school for the boys who formed part of the establishment. These schools had existed as long as the choirs; and the pupils were admitted, at the age of about seven years, on account of their musical gifts, for the purpose of receiving a musical training, to which was added a good general, and usually classical, education. The boys assisted in the daily services of the cathedral, and received instruction in music from the organist. Other education was provided for in some cases in a cathedral school, or in a grammar school in the cathedral city. One of the earliest of the cathedral schools was attached

to St. Paul's, London, and dates from the beginning of the twelfth century. The schools of York, Lincoln, and Lichfield gained a great reputation; but in numerous cases the Reformation put an end to the old-monkish cathedral schools and established grammar schools, connected with the new cathedrals, in their places. The school of Hereford Cathedral, the statutes of which were drawn up by Archbishop Laud, was not disturbed by the Reformation, and was kept in a spacious brick building adjoining the cathedral. Laud gave the utmost latitude to the Dean and Chapter in the choice of boys, but required that their interests should be watched over to their best advantage. Music, classical education, or some liberal faculty was to be provided to qualify them to gain their own livelihood, and the choristers made themselves a reputation by their successes in gaining lucrative appointments.

The Endowed Schools Commission, in 1863, led to assistance being given to the modern cathedral schools by the Ecclesiastical Commissions; but, at the present time, few remain, except at York, Durham, Canterbury, and Hereford.

CATHOLIC (ROMAN) SCHOOLS.—The religious changes of the 16th century in England swept away or altogether transformed the character of the existing Catholic schools. More than two hundred were shorn of their endowments, and disappeared in the latter years of Henry VIII's reign and the ensuing Protectorate. Mediaeval England had built up a system of schools which opened up great educational possibilities. No town was without its grammar school. The seven classes of schools—Cathedral, Monastery, Collegiate, Hospital, Guild, Chantry, and Independent—afforded a liberal provision of free education for the son of the hind as well as for the future Churchman, lawyer, or clerk. The beginnings of our elementary school system were found in the A B C Schools, Reading Schools, and Reading and Writing Schools, about forty-five of which existed before the Reformation. The grammar schools gave a higher education, fitting their pupils for the Church, the universities, and the professions. Herefordshire, with a population of 30,000, had seventeen of these schools, and recent researches show that there were not less than ten in each county. On this basis, there were, in England, 400 schools for a population of 2,250,000, or one grammar school for 5,625. As in 1864 there was only one such school for 23,750 of the population, the educational provision of mediaeval England in this direction compares favourably with even that of the Victorian era (Leach: *Schools of Mediaeval England*).

With the accession of Elizabeth, Catholic schools as such ceased to exist. In 1581, an Act was passed forbidding the keeping and maintaining of any schoolmaster who did not possess a licence from a bishop of the Established Church. The penalty was £10 per month and a year's imprisonment for the unlicensed schoolmaster. James I increased this to a fine of 40s. a day. Later on, the Clarendon Code sent the Catholic or Dissenting schoolmaster to prison for three months. The removal of their civil disabilities by the Acts of 1778, 1791, and 1829, enabled the Catholics to make some educational provision for their children in accordance with their principles and views. In the interim, there had been a few fugitive efforts to evade the law by establishing schools, but they were very short-lived. Alexander Pope, the poet, attended

a Catholic school at Twyford, near Winchester; but the political troubles of 1745 ended its existence. The flight of the Jesuit and other religious orders from France and Belgium in the days of the "Terror," and the dawning of a greater spirit of toleration, brought about the beginning of an educational renaissance for English Catholics. The seizure of Douai College in 1793 led to the foundation of St. Edmund's College, Ware, and Ushaw College, near Durham, both of which still flourish.

The famous Jesuit school at St. Omer, founded by the English Father Parsons in 1592, was finally transferred, in 1794, to Stonyhurst, in Lancashire, and now ranks amongst the great public schools of the country. The Benedictines from Lorraine and Douai founded Ampleforth College, in Yorkshire, in 1803, and Downside in 1815. (See STONYHURST COLLEGE.)

Catholic Elementary Schools. Meanwhile, there was a steady growth of the Catholic population in the large centres of population; and London, Birmingham, Liverpool, Manchester, etc., had a fair sprinkling, mostly of Catholic poor, in their midst. As early as 1764, there was a society in London for "The Instruction of the Children of Catholic Indigent Parents," but there is little record of its work. Towards the close of the eighteenth century, about ten Catholic elementary schools existed in England. By 1829, this number had risen to nearly seventy, and in 1851 they numbered 311. The latter number, however, included many Private Venture schools; and the number under Government inspection in 1849 was only about fifty. Although Government grants began with an appropriation of £20,000 in 1833, increased to £600,000 in 1850, it was not until between 1848–50 that Catholic schools participated in the school grants. The formation of the Catholic Poor School Committee in 1847 was largely responsible for securing this financial assistance. In its purpose it corresponded to the National Society, and the British and Foreign School Society. The Committee was immediately recognized by the Government as the official Catholic education authority, and re-organized in 1905 as the Catholic Education Council.

The launching of the Forster Education Act found 354 Catholic schools, with an attendance of 101,933 children. This great increase had been brought about by a steady immigration from Ireland, accelerated by the famine of 1846. The Compulsory Education Act of 1876, and the interim developments created a demand for additional school accommodation. Catholics had now 598 schools, and every year saw an addition to their number. Between the years 1872 and 1900, no less than 658 new Catholic schools were built.

Besides the cost of building, the heavy maintenance charges due to inadequate school grants laid a great financial burden upon the Catholic body. The limitation of grant to 17s. 6d. a head, unless the income of the school from other sources reached a like amount, pressed heavily upon poor schools whose supporters were needy themselves. Catholic schools lost heavily through this limitation, and its abolition in 1897 was a welcome relief. The voluntary subscriptions, a condition of Government support, showed an ever-decreasing tendency. By 1897, they had dropped to 7s. per head in the Voluntary schools, and this was the only off-set they had to the 19s. per head which the Board

schools obtained from the rates. The Act of 1891, which gave a fee grant of 10s. per head, improved the income; as, in 1883, according to the Blue Book, 13·11 per cent. of children in the Catholic schools had to be admitted without fees on account of their poverty, whilst the fees actually received only reached an average of 9s. 5d. a head. Still, the increasing cost of education made further help imperative. The Act of 1897, besides abolishing the 17s. 6d. limit, gave an Aid Grant of 5s. per head to the Voluntary schools, but this did not still the cry for more. A cost of £1 1s. 7½d. per head in 1860 had risen to £1 5s. 4d. in 1870; to £2 1s. 11½d. in the Board schools and £1 14s. 7½d. in the Voluntary schools in 1880; to £2 5s. 11½d. Board and £1 16s. 11½d. Voluntary in 1890; and to £3 0s. 9d. Board and £2 6s. 4d. Voluntary in 1902. The Act of 1902 saved poorer schools from a financial attrition which would have led ultimately to their extinction.

Catholic schools shared in the release from the burden of maintenance, but the building question became more acute. Many of the schools were old and ill-suited to modern requirements, and recent years have witnessed the erection of many new schools and improvements to others. The number of Catholic primary schools in 1918 (according to the Report of the Board of Education) was 1,091, with accommodation for 383,918 scholars. Of these schools, the great majority are situated in the large urban areas; 24 are in areas where there is only a single school; and 143 in other areas containing two or more schools, but in which there is no Provided school.

Catholic Training Colleges. For the training of Catholic teachers, there are seven colleges for women in England, and one for men. In 1918 there were 723 women students in training, and 116 men.

Other Catholic Schools. Catholic Poor Law and other special schools are mostly in charge of religious orders whose members are specially trained for the work. Of Catholic Poor Law schools, there are 13 for boys and 28 for girls. Reformatory schools for boys number 5, and for girls 2. There are 14 boys' and 12 girls' Industrial schools.

Secondary Schools. The amended Secondary School Regulations of 1919 make it possible for more Catholic secondary schools to receive recognition and grant from the Board of Education. According to the *Catholic Directory* (1918), there were 422 Catholic secondary schools, with 31,018 pupils; but, of these, only eleven for boys and thirty-three for girls were on the grant list, and three others were recognized as efficient, but received no grants. In the recognized schools, there were, in 1918, 3,023 boys and 6,630 girls. St. Mary's Hall, Stonyhurst, is recognized as a training college for men secondary school teachers; and the Sisters of the Holy Child, London, and the Notre Dame Order in Liverpool, provide similar recognized facilities for the training of women secondary school teachers. The removal of the ban upon Catholics attending the Universities of Oxford and Cambridge by the Holy See in 1895, and the subsequent establishment of four Catholic halls at Oxford and one at Cambridge has led to students in increasing numbers proceeding from the Catholic colleges to the older universities.

Altogether, the future of Catholic schools can be regarded with equanimity.

The primary schools are tacitly acknowledged as

part of the national system. The children have educational opportunities denied to them before the Act of 1902 and now added to by the Act of 1918. Catholic teachers no longer groan under the double burden of overwork and underpay. The schools do not depend for their maintenance upon the eleemosynary alms of the poor, and there is a greater realization of their value as an important factor in the development of the intellectual and economic forces of the nation. W. O'D.

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CATHOLIC (ROMAN) SECONDARY EDUCATION.—In number and size Catholic Secondary Boarding Schools are much greater by proportion than the small number of Catholics in England. This fact is traceable to their history, for, during the two and a quarter centuries that the penal laws against them were in force, they founded and carried on colleges on the Continent for the education of their clergy, which became centres of Catholic life; and the laymen of the upper classes, who adhered to the old religion, used to patronize them for their sons, though not destined for the Church. It was, indeed, a penal offence to send their children "across the seas" to be educated, but they faced the risk of fines and imprisonment in order to educate their children. The chief colleges so established were that of Douay in Flanders—known to fame by the Douay version of the Bible edited there—established by William Allen, afterwards Cardinal, in 1568; and the Jesuit College at St. Omer, in the north of France, due to the initiative of the notorious Father Parsons in 1592; but there were several others. Most of them came to an end during the French Revolution; and the laws against Catholic schools in England having been mitigated by the Relief Act of 1791, the colleges were re-founded on English soil. Thus it comes about that the chief Catholic schools to-day, such as Stonyhurst, Ushaw, Downside, Ampleforth, Woolhampton, and St. Edmund's (Ware), all trace their original foundation to a continental home of the sixteenth or early seventeenth century. Two of the old Colleges—Valladolid, under the patronage of the King of Spain (1589), and Lisbon (1622)—escaped the Revolution, and are still carried on in the places where they were founded. In similar manner, the English College in Rome (1578) still exists; but, being exclusively for adults who are students of philosophy and theology preparing for Orders, it stands on a somewhat different footing.

During the course of the nineteenth century, the number of Catholic boarding schools in England has been more than doubled, the new ones being for the most part established either under episcopal control, or by the various Teaching Orders; and, at least one of them—the Oratory, Edgbaston—calls for special mention, as having been founded under the direction of Cardinal Newman, with a system differing somewhat from the more traditional one among Catholics. In recent years, a few private preparatory schools of note have been

established ; but, except for these, private schools are rare among the English Catholic body, and all the chief schools are under ecclesiastical control.

Government. The history and mode of government of Catholic schools have produced some notable differences between them and the other schools of the nation. In the first place, there are no regularly constituted governing bodies. The government depends either on the bishops or the heads of the religious orders. Then there are no endowments, and yet the fees are far lower than those payable at an ordinary English school of the same standing. This is only rendered possible by the bulk of the masters being priests or members of an Order, and receiving either a very low salary or none at all beyond their keep. All the masters and boys live in the same building, and the boarding-house system is unknown. Until recently, there were no scholarships of any kind, either on entrance or when leaving ; and as, until recent years, Oxford and Cambridge were prohibited to Catholic boys, there was little stimulus for the more gifted ones to aim at a really high standard of education. The examinations of the London University, which for many years were frequented—though they gave access to a degree—were in other respects an inadequate substitute for a regular university course. On the other hand, those acquainted with Catholic schools will bear witness to the general conscientious and industrious teaching given by the masters ; and the chief training Orders—the Jesuits, Benedictines, and others—have definite traditions, born of long experience both in England and on the Continent, for stimulating emulation among their pupils ; so that it is probable that the average boy would receive at a Catholic college as good an education as elsewhere—probably a better one, as he would receive rather more attention. It should be added that, since 1895, Oxford and Cambridge have been officially open to Catholics, and considerable changes have followed in their schools. The certificate examinations of the Joint Universities' Board has displaced the London Matriculation as a leaving examination ; entrance scholarships have been founded ; open scholarships at the universities have been competed for with success ; and, in general, more effort has been made to enable a clever boy to do justice to himself. But a change of this kind necessarily takes time, and the results up to the present have hardly reached the standard which is hoped of them for the future.

Characteristics. In their general life, Catholic schools show considerable differences from non-Catholic. The importance of religious influences, both in and out of school, is viewed more strictly, and the daily attendance at Mass and other religious exercises forms an important part of the day. The supervision out of school is on a stricter model. The rules of "bounds" are essentially different, the boys being usually limited to a playground. It is probable that some of these rules are, in part, due to the foreign history of the schools, and the fact that they were carried on in towns according to the usual practice on the Continent ; for, although the spirit of the colleges, even when abroad, was thoroughly English, perhaps even the more so owing to their foreign surroundings, part of the system and even of the terminology are unmistakably of foreign origin, and have survived in England owing to the comparative isolation of Catholic life during the first half of the nineteenth

century. Thus masters are styled "professors" ; boys are called "students" ; and, perhaps most quaint of all, the names of the forms, "Rhetoric," "Poetry," "Syntax," "Grammar," etc., still survive in some schools, though they have long ceased to have any relation to the work studied by the various forms.

Secondary Day Schools. In the matter of day schools, the Catholic body is less well provided. This is partly due to the fact that their middle class is comparatively small, but, at least, partly to the stringent regulations passed by the Government when they systematized the secondary education of the country in 1906, by which the founding of new grant-earning Catholic schools became impossible. To the existing schools a waiver of the anti-denominational clauses was granted ; but in new areas, however much the number of Catholics may justify a Catholic secondary school, such a school cannot earn any grant, and consequently practically cannot be established. This is a grievance of which they loudly complain. For such schools have to be staffed chiefly by laymen, who must be paid salaries on the standard scale, and consequently, in order to compete with County Council or other schools, a public grant is a necessity. The schools which obtained a waiver have continued to flourish. The masters are Catholics, and the proportion of non-Catholic pupils is always small, so that it is found possible to create a Catholic atmosphere and bring up the pupils under full religious influences. In other respects, the day schools do not differ much from non-Catholic ones, for they belong to an epoch when the isolation of the Catholic body has been to a great extent broken down. Some reach a high degree of efficiency, and most, if not all, reach a fair or good standard of work.

The Secondary Education of Women.—A few words must be added about the secondary education of women. This is nearly all in the hands of nuns. The history of Convent schools is somewhat analogous to that of boys' schools. During the seventeenth and eighteenth centuries there were a number of English convent schools on the Continent, and most of these, being dispersed during the French Revolution, were re-founded in England. The majority of them still exist, and continue to do good work, though on a somewhat small scale. About the middle of the nineteenth century began that influx of the modern Teaching Congregations of Nuns which has now covered the country with convent schools, great and small. The two chief ones were the nuns of the *Sacré Coeur* and those of *Notre Dame*, but there are many others of all kinds ; and convent schools, for both boarders and day-pupils, are to be found in every place of note. Some of them are large and exceedingly efficient—inferior to none in the country—others small and inefficient ; and between these two extremes is to be found almost every possible standard. But even in the least efficient convent school, the nuns exert a powerful and refining influence over their pupils, and their own self-denial and hard work command the respect of those who come in contact with them, so that their pupils commonly number many who are not of their faith. B. WARD.

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CATHOLIC (ROMAN) TRAINING COLLEGES.—(See CATHOLIC (ROMAN) SCHOOLS.)

CATHOLIC UNIVERSITY OF AMERICA.—A pontifical institution at Washington comprising schools of the Sacred Sciences, Philosophy, Law, Letters, and Science. It was founded in 1884, and the School of the Sacred Sciences was opened in 1889, followed by the School of Philosophy in 1895. The University has since become the centre of learning for the Catholic laity, the diocesan clergy, and the religious orders. Many seminaries, colleges, and other Catholic educational institutions are affiliated to the University, and a high standard of scholarship is maintained. The students number upwards of 200. There is a library of over 100,000 volumes.

CATHOLIC UNIVERSITY OF IRELAND.—(See IRELAND, THE NATIONAL UNIVERSITY OF)

CATO MAJOR.—Marcus Porcius Cato, also known as Cato the Censor (234-149 B.C.), was a distinguished Roman soldier and politician. In civic affairs he opposed the Roman nobles in their attempts to introduce Greek luxury into Rome. The chief objects of his attack were the Scipio family, but his efforts were unavailing. In later years, he studied Greek literature. He was a strong advocate of war with Carthage to secure the safety of Rome, and his speeches in the Senate always contained the words "*Delenda est Carthago*" (Carthage must be destroyed).

CAUCHY.—The founder of the great French analytical school of mathematicians of the nineteenth century was Augustin Louis Cauchy (1789-1857). He taught at irregular intervals and in various places, owing to political circumstances, and his great influence was thus exerted chiefly through his many excellent text-books on higher mathematics. In the *Cours d'analyse: analyse algébrique* of 1821, Cauchy gave a thoroughly rigorous and modern form of Euler's (*q.v.*) *Introductio*. The strict treatment in it of infinite series has become classical. The breach with Lagrange's (*q.v.*) ideas, caused by the rigid foundation of the infinitesimal calculus on the not new, but thoroughly reformed, doctrine of limits, first appeared in the *Résumé des leçons . . . sur le calcul infinitésimal* of 1823. Other books on the calculus and its applications to geometry were afterwards published. Cauchy's *Exercices de mathématiques* are collections of memoirs, in which there is some repetition of original parts of his text-books. His work is rather drily expressed, and he does not always seem conscious of the exact bearing of the important results he discovered—particularly in the theory of functions based on the idea of complex integration. His influence combined with that of Euler to shape the very important work of Niels Henrik Abel (1802-1829), and with that of Gauss (*q.v.*) in the work of Dirichlet and Riemann. The work of Cauchy's School proper was carried on by Joseph

Liouville (1809-1882); Briot; Bouquet; Charles Hermite (1822-1901); and, in a less original way, by the Abbé Moigno (1804-1884). P. E. B. J.

CAUTION MONEY.—"Caution" is a legal term denoting an obligation by which a person binds himself to perform an obligation undertaken by another if that other fails. "Caution" money is a deposit made by a student on entering college as a security for the performance of his obligations.

CENTRAL HALL.—(See BUILDINGS, SCHOOL)

CENTRAL INSTITUTIONS, SCOTLAND.—(See SCOTLAND, CENTRAL INSTITUTIONS OF)

CENTRAL LABOUR COLLEGE, THE.—(See LABOUR COLLEGE, THE.)

CENTRAL SCHOOLS, THE CURRICULUM AND ORGANIZATION OF.—With the development of elementary education there arose a special necessity for dealing with the children who reached the highest class in their schools at an early age. Frequently there were children in three different standards all in charge of one teacher, who, instead of being able to concentrate on the children who were about to leave, had to divide his attention among children on different levels of attainment. To remedy this weakness the School Board for London and other education authorities marked certain schools as Higher Elementary, or Higher Standard, Schools, and endeavoured to transfer to these the children who had reached the higher standards in the neighbouring schools. Although a step in the right direction, these schools were still under considerable disadvantages, for while the children transferred from the other schools were to a certain extent selected, the weaklings who entered the Higher Elementary School at an early age passed automatically into the higher classes and formed a drag on the others and again the organization of the School had to make provision for too wide a range of pupils.

In 1910, the London County Council decided to remedy this by the establishment of a new type of school which should provide for the wants of children qualified to be presented for the Junior County Scholarship Examination and who showed a certain degree of proficiency in that test.

To be eligible for this examination a child must be 11 years old and must have reached Standard V of the Code or its equivalent. The successful candidates are arranged in order of merit, and those with the highest marks are admitted to the Secondary Schools, where they may receive maintenance grants as well as free education. Those next in order are eligible for admission to Central Schools as far as the accommodation will allow. The parents are required to sign a declaration that it is their intention to keep the children at the School for the full course of four years, that is to the end of the school year in which they reach the age of 15. There is no penalty attached to the breach of this understanding and there is considerable difference in the loyalty with which it is observed in different schools. As the most important part of the work is taken towards the end of the course, the teachers naturally do their best to retain the children till the end of their fourth year. In London it is the practice to admit to a Senior Evening Institute a child who has

completed his four years, or who has come within three months of its completion. It is the usual custom to refuse open testimonials to those who leave earlier, although inquiries from prospective employers are always answered.

Curriculum. With regard to curriculum the Central Schools of London are of two types. In both the aim is to give the child a good general education, and in the one type the instruction has a commercial bias, while in the other the bias is industrial.

In the case of a Central School with a commercial bias the course aims at cultivating the general intelligence of the pupils and teaching the fundamental principles of subjects that will enable them to enter a large business house, a bank, or insurance office, and the heads of such establishments who have tried the ex-pupils of such schools speak of their work in terms of high praise and seek to obtain others as vacancies occur. In the case of one with an industrial bias more attention is paid to mathematics, science and manual training in wood and metal. The aim, however, is not to prepare for any specific trade, but to train the pupil's mind and hand so that when he enters on any industrial occupation he may bring to bear on his work greater mental alertness and manual skill.

At first the Central Schools were somewhat hampered by rigid rules respecting the allotment of time to the different subjects. These have been relaxed, and the head masters and mistresses are allowed more latitude, although they are expected to approximate to the original limits. The following table shows the time devoted to each subject in a typical Central School with a commercial bias—

NUMBER OF MINUTES PER WEEK GIVEN TO EACH SUBJECT.									
	IVa	IVb	IIIa	IIIb	IIa	IIb	Ia	Ib	
Scripture . . .	150	150	150	150	150	150	150	150	
Recreation . . .	100	100	100	100	100	100	100	100	
Physical Exercises . . .	60	60	60	60	60	60	60	60	
Manual Training . . .	—	—	—	—	140	140	140	140	
Drawing . . .	120	120	120	120	120	120	120	120	
Practical Science . . .	120	120	120	120	120	120	120	120	
French . . .	240	240	240	240	240	240	240	240	
Shorthand . . .	120	120	120	120	—	—	—	—	
Book-keeping . . .	120	120	120	120	—	—	—	—	
Music . . .	—	—	—	—	—	—	—	—	
Business Methods . . .	40	40	40	40	40	40	40	40	
English . . .	100	100	140	120	150	160	160	150	
Arithmetic . . .	110	100	80	100	110	100	100	100	
Algebra . . .	100	100	120	100	100	90	100	100	
Geometry . . .	60	60	60	60	60	60	60	60	
History . . .	70	80	70	80	80	90	80	80	
Geography . . .	80	80	80	80	80	80	80	90	
Composition . . .	60	60	60	40	60	60	60	60	

It will be seen that manual training is taken in the first two years, where it is of great educational value, but is omitted in the third and fourth years on account of the introduction of book-keeping and shorthand into the syllabus.

Every pupil spends two hours a week in drawing, and the course provides for sketching common objects in pencil, crayon and water colour. Considerable attention is also paid to the elements of design and to lettering, and many ex-pupils find this very valuable in the situations they take up, one youth being set at once to design a cover and draw illustrations for the catalogue of a large firm of merchants whose service he entered.

A lesson in French is given every day and many of the ex-scholars put their knowledge of the language to great use in the businesses they enter, while the great majority benefit greatly by the

culture arising from the study of a language in addition to their own.

Shorthand is a very popular subject and many of the boys attain great proficiency before they leave. Indeed it is the common thing for boys to take down in shorthand the speeches made at the Prize Distribution, and to reproduce their notes with the help of the typewriter, instruction on which is given out of school hours.

Vocal music is included on account of its refining influence, but unfortunately it has to be dropped by all the boys in the fourth year (and by many in the third) on account of their voices breaking.

The history syllabus comprises the outlines of British history in the first two years, while the study of the colonial development and expansion of the Empire in the third year is co-ordinated with the study of the geography of the colonies which is taken in the same year. In the fourth year the pupils are introduced to some of the great movements, such as the French Revolution, which have left their mark on the history of the world.

In the Central Schools with an industrial bias from ten to twelve hours per week are devoted throughout the whole four years to practical work. In the case of boys this consists of practical measurements of all kinds and work in elementary chemistry and physics, drawing, modelling in clay and in wood and metal work. Girls spend a corresponding amount of time in domestic subjects, drawing, including design (which is carried out in needle-work), dressmaking, millinery and in scientific study similar to that of the boys.

There are certain schools having both sides, commercial and industrial.

G. COLLAR.

CENTRAL SCHOOL OF ARTS AND CRAFTS, THE.—(See LONDON COUNTY COUNCIL, EDUCATIONAL WORK OF THE.)

CENTRALIZATION.—This is a special case of localization, in which the *locus* is the centre. The term is most often used in reference to administration, and connotes a scheme of control—including officers and an office—working from within outwards: a central and higher command, authoritative in inception of policy and plan—except as dependent upon a legislature—and in direction of procedure. All authority is in a manner centralized: the distinction between authority and authority is a question of complexity and degree of centralization—which itself is not merely necessary, but inherent.

A scheme of government is involved; and it is in questions of government—of its theory and practice—that centralization is philosophically considered. The autocratic form is most centralized—the democratic least: and the development of the freest democracy with the most liberal institutions will, on the whole, pass furthest from a centralized establishment. But this is not a necessary feature of the power of the people or a condition of its growth: the process is typical of the social and political genius of a race or nation rather than of a particular form of government. A passion for personal freedom, combined with exceptional self-reliance and capacity in political initiative, will resolutely avoid an exclusive centralization. But, when individual independence is less characteristic than a general uniformity of sentiment; or where personal opportunity falls short in variety of life

and occupation, or in manifold occasion of acceptance of responsibility—the reference to a chief or a system or an environment becoming customary and habitual; then the political tendency is towards centralization. The individual may be content with a bureaucratic scheme and organization provided that he retains something of ultimate selection and choice in a satisfactory franchise. We may illustrate. France and England are thoroughly democratic in their form of government, but the system of France in practice is much more regularly centralized than is that of England. And this perhaps might not be expected in a republic as compared with a monarchy, however limited. It is clearly a case of character rather than of government, and is internal rather than external. The Englishman will compromise and love variation; the Frenchman will be logical and love uniformity. It was a French Minister of Education who was proud to be assured that at any hour in the school day he knew what every boy in a French public school was learning or doing. And he would impose time-tables and prescribe text-books accordingly. Administration such as this is highly centralized.

Reform in England is usually Centralization followed by Decentralization. The tendency with us is towards what we conceive as a freer system. Powers of government are distributed and delegated. Heavy strides in this direction have been taken during the last century. Municipal corporations and county councils have come into existence, and have had greater and ever greater powers entrusted to them. Local authorities thus constituted have grown busier and busier. Questions of public health; the care, lighting, and protection of our streets, communication; sewage; education in ever broadening definition—all have been taken up locally, and all apart from a central control except as conditioned by legislation and the approval of specific measures by an imperial department of government. We will illustrate this decentralizing tendency and process—after precedent centralization—from our public educational system. In the earlier years of the last century there was not much primary schooling in England. It seems to have grown out of religious and philanthropic zeal, and to have been at first individual and sporadic. Churchmen by way of the National Society, and others by way of the British Schools Society, then built and maintained schools, and in due time an Education Department of government took charge of what was individualist and partially chaotic: here is necessary progress towards centralization. Quickly comes decentralization. The Elementary Education Act of 1870 gives birth to school boards and entrusts them with large powers: local authorities with specific duties. In the meantime, the organization of schools generally is defective; within the system are board and voluntary schools, but no place is found for schools affording a more advanced course of instruction. By the Education Act of 1902, further steps are taken, with a more extensive organization—this again being a process of centralization, so far as outside and individual schools are collected and incorporated, and exposed to the direction and control of a central Board of Education; but forthwith we find a typical decentralization. Local education authorities have powers of management and control in large measure; and even when the single school keeps its independence in regard to the local authority, and this has to be

in immediate relationship with the Board of Education, powers of management are conferred upon its governing body. And the whole process thus illustrated is constant: the independent initiative of individuals requiring an organization—and so demanding a central authority; and organization, once taken in hand and put on a reasonably satisfactory footing, requiring the delegation of almost all the management and a good deal of the power to a local authority.

Characteristic Merits and Defects of the Two Methods of Control. Centralization makes for uniformity and discipline, and the advantage of a wide survey and the consequent accumulation of a large experience: the more extensive its area of control, the better its opportunities of excellence in detail. Its merits lie in the initiation of reform and in the enforcement of procedure of general rather than of partial value and importance. It tends to kill variation from the normal. With the upspringing of local activity, there is at once a decentralizing influence, while the delegation of authority will itself, in turn, foster local activity. The merits of decentralization arise from local and intimate knowledge and a natural vitality of interest. But a certain provincial triviality and meanness is not easily avoided. It may be added that centralization makes for routine and possible inefficiency, and that the adjustment of finance is one of the nicer points of detail in decentralization. The aim is to make the area pay that share of cost which shall cultivate a desire for economy without impairing a desire for improvement. A. E. L.

CEPHALIC INDEX.—(See CRANIOMETRY.)

CEREBRO-SPINAL MENINGITIS.—(See INFECTION AND SCHOOL CHILDREN.)

CERTIFICATED TEACHER.—On passing the Certificate Examination conducted by the Board of Education, or the Final Examination for Training College Students, conducted by the Board or by some approved examining body, a teacher becomes a certificated teacher, and is, in a limited sense, fully qualified.

The fullness of the qualification is, in the legal sense, that no further certificate need be obtained in order to qualify a teacher, so far as Code requirements are concerned, for any position in an elementary school. He is, in fact, entitled to practise as a teacher, provided that he can find an employer.

The limitation of the qualification is, in the practical sense, that the certificate does not guarantee its holder to be able to deal efficiently with all the problems of his daily work. The young certificated teacher has to prove himself, to learn by experience. That the Board of Education recognizes the limitation is shown by the fact that a teacher cannot be recognized as a head teacher until his certificate has been endorsed after one year's satisfactory service. Another sign that the limitation is recognized is that a certificated teacher cannot be enrolled on the Teachers' Register until after three full years of experience. (See TEACHERS' REGISTRATION COUNCIL, THE.)

The Meaning of the Certificate. It is impossible to state the maximum meaning of the certificate. It cannot, however, be too strongly asserted that the average certificated teacher is well above the minimum in all respects; and there are a few exceptional cases of certificated teachers who, holding no

other certificate or diploma than the one which gives them their professional status, are distinguished by technical ability, scholarship, and wisdom of as high an order as any members of any profession.

The minimum requirements for a training college student are that he shall reach a standard approximately equal to that of a pass in a university matriculation examination in three subjects: English; and two selected from History, Geography, Mathematics, Elementary Science, and Welsh (in Welsh colleges only). He must also attain a certain degree of skill in teaching, and must pass an examination in the principles and practice of teaching, in hygiene and physical training, in reading, recitation, and drawing.

In special circumstances, he may even take only one subject in addition to English and professional subjects, so that the barest possible requirements are distinctly small.

An average student will take at least four subjects, chosen from the general subjects mentioned above, or from the "additional subjects"—French, German, Latin, physics, chemistry, botany, rural science, housecraft; and will attain the standard of a "pass" in a university intermediate examination for a degree, in at least one and perhaps, on an average, two of these subjects. This represents a reasonable starting point for further work, and affords some grounds for hoping that in the not distant future every certificated teacher will have acquired some enthusiasm for, and scholarship in, at least one branch of knowledge. To entertain this hope is by no means to disregard the fact that many certificated teachers already satisfy the requirements hoped for; but if they are enthusiastic and scholarly, it is because they have had good fortune in meeting inspiring persons at some critical point in their career, and not because the national system has aimed at producing teachers of this character.

The Aim of the Present System. The present system aims at raising the standard to that set by the best of the older teachers. It aims at selecting suitable candidates for the teaching profession in the secondary rather than in the elementary schools, so that they have an enthusiasm for learning, and a good general education when they go to a training college. The standard of the work in the training college is, therefore, rising toward the standard of the first two years in a university course, and indeed may be said to be not far below it.

This brief review serves to supplement the remarks about the training college student (*q.v.*), and to show, in relation to the life-work of the newly-certificated teacher, the importance of his realizing consciously and explicitly that he must be a learner if he is to be a teacher.

The certificated teacher of the present day, then, has qualified himself for his work by continuous endeavour to increase his knowledge, not only of children, but of men and affairs. He is, though critical of suggestions, responsive to those suggestions which seem to him to promise benefits to his pupils. In other words, he takes his professional duties seriously. In English public elementary schools, we shall find three important groups of teachers, all certificated. Each school, or department, has a head teacher, and usually either class teachers or specialist teachers, or both (*qq.v.*). (See also **RECOGNITION OF THE TEACHER.**)

A. C. C.

CERTIFICATES A AND B.—(See **OFFICERS' TRAINING CORPS, HISTORY AND DEVELOPMENT OF THE.**)

CEYLON, THE EDUCATIONAL SYSTEM OF.—

It was only a hundred years ago that the Singhalese were ruled by their own king, and, in those days, there was a temple (Pansala) in every village, where boys of high caste could receive a vernacular education. There were no other schools of any description. Only reading, writing, and arithmetic were taught in the Pansala. Writing was done on a sand board instead of a blackboard; and, as the use of paper was unknown, all the class writing was done on palm leaves. Even to-day, books of palm leaves are, to a certain extent, in use. The teaching of grammar was considered absolutely essential. All letters in the Singhalese alphabet are of Sanskrit origin; and it is due to this fact that a good deal of Sanskrit influence is noticeable in the Singhalese language and literature.

During the reign of the kings, no woman of any caste could be educated at a Pansala. In the year 1815, Ceylon was ceded by the native chiefs to the English and, after their entry into the country, the whole system of education underwent a change. Schools were opened one by one in almost every village, and called Gansaleha schools. In them, only the vernacular is taught, and they are open both to boys and girls. In addition to the Government schools, there are others opened by various missionary societies, notably the Church Missionary Society. In all these mission schools, education is gratuitous; but in the Government schools established in towns, where English is taught as well, a small fee is always asked from those who wish to receive an English education.

In some villages, education is more or less compulsory, although yet very elementary. One noticeable and natural result of the opening up of modern schools throughout the length and breadth of the island has been that the old Pansalas do not attract the same number of students as in the olden days, when they were the only places where one could receive any sort of education. Pansalas are now exclusively attended by students who wish to become priests, for which purpose they must have a good knowledge of Sanskrit, which is taught only in these old institutions and not in the modern schools. Buddhist schools have also been opened by various societies on the model of the missionary schools; but for lack of proper funds and good teachers, they do not reach the same level of efficiency. As regards the thoroughness and the quality of education, missionary schools occupy the first place, and consequently attract a large number of students. Perhaps the number would be still larger were the parents not apprehensive that their children may adopt the Christian faith.

The student has to enter a college if he intends to continue his study beyond the school. These colleges exist only in large cities, and are run on the same lines as the public schools in Great Britain. Fees are fairly high, considering the comparative poverty of the masses. This is a great check to the students of humble parents, who otherwise would like to receive a higher education in these institutions. There are no public scholarships either, which might have enabled a certain number of poor students at least to carry on their studies. The provision of scholarships is a great and pressing need.



Residence Buildings, University of Alberta, Edmonton



University of New Brunswick. Main Building

Higher Education. Schools and colleges for girls have been opened by the Government and also by the missionary societies, but these institutions are yet in their infancy, and not properly developed. The number of such students is not large, although daily on the increase. The time is not far distant when the cry for the education of girls will be as insistent as it is to-day for boys.

Government shows little inclination to encourage a wider education in the island, which is to be greatly deplored, as the demand for a universal education is keen and genuine. The system of education also requires a thorough investigation to remedy the existing defects, and to bring the schools and colleges to a modern standard of efficiency. Special tribute should be paid to the educational work of the missionary societies, which have opened schools not only in large cities and villages, but even in the wildest and remotest parts of the island.

A. HALANGODA.

CHAINED LIBRARIES.—(See LIBRARIES, MEDIAEVAL.)

CHALK AND PLASTER AS EDUCATIONAL MEDIA.—The aim of work in chalk is to provide a concrete and satisfying means of self-expression for children of all ages from eight years old. It can be used to illustrate nearly all the interests of a child's everyday life: his reading, history and geography lessons, Nature study, etc.

Material. Whenever possible, chalk should be used rather than plaster, as it is much easier to carve and the finished model presents much clearer-cut lines and finer details. When it is impossible to obtain chalk, plaster is a satisfactory substitute; but only the finest plaster, as this sets smooth and even. The powder should be stirred into a bowl of water until it is of a fairly thick consistency, and then poured into a mould of the shape required or on to a flat board, when it can be roughly shaped while it is still unset.

Tools and Workroom. Very few tools are required, and much can be done with an ordinary pen-knife; but the best thing is a knife set in a wooden handle, with the blade ground obliquely after the style of a cardboard modelling knife (London pattern). A broad-bladed chisel is very useful for large surfaces, and some pointed tool for the more detailed work. As the chalk dust is very easily scattered and treads into the wooden floors of the ordinary classroom, a special room for this work is advisable.

Method. The easiest models for most beginners are those in high relief, such as a letter or a box; as, if the child breaks the chalk or makes a mistake, the model can be cut off and a new one begun on a fresh surface. Some children find it easier to begin with a simple solid model (*e.g.* a pot, house, or church). This work does not involve drawing as do the relief models, but it necessarily means that the children must have a clearer mental image in view before beginning to carve. Many children find great fascination in carving villages, lighthouses, castles, etc., out of a block of chalk whose rugged outline often suggests the model. Soon they will attempt work in bas-relief, and here their choice of models is unlimited. Practically anything that interests the child can be carved, and by this time the work usually possesses some artistic quality, however little, and so satisfies yet another side of the child's nature. When beginning a relief model, a surface of the chalk should be smoothed and the outline

drawn on it; then the child should cut round the outline with vertical cuts, the horizontal and oblique cuts being made afterwards to meet the vertical. This outline will be clear and sharp, and is not so liable to be damaged by further cutting. Thus chalk and plaster may be used as a means of self-expression, and it is to many children easier and more satisfactory than either clay-modelling or drawing. It enables them to express any clear mental images they may have, and at the same time it helps them to make these images more accurate.
G. M. H.

CHALONER, THOMAS.—Fellow of Jesus College, Cambridge; was appointed Master of Shrewsbury School, where he had formerly been a pupil, in the early years of the reign of Charles I. The school had then fallen on evil days; and Chaloner, who was warmly welcomed, met with immediate success. He loved learning, he loved the school, and he possessed a genius for winning the lasting love of his boys. The numbers rapidly increased, and within five years reached nearly 500. The outbreak of civil war reduced the number of pupils, and Chaloner's loyalty to the king led to his expulsion. He took with him the school register, and it accompanied him to various schools, large and small, in which he taught between 1643 and 1662. He was compelled to go to London, to renounce formally his post as head master of Shrewsbury, and to suffer a term of imprisonment. He afterwards opened a school near Ellesmere, where he received many Shrewsbury boys; and, later, one at Hawarden, in which he was compelled to teach English grammar to the exclusion of Latin and Greek. In 1653 he became head master of Ruthin School, where again he suffered persecution from the Government. In 1662 he was restored to his old post, which he retained until he died two years later.

CHAMBERS, EPHRAIM.—(See ENCYCLOPAEDIA, THE EVOLUTION OF THE.)

CHAMBERS OF COMMERCE.—(See ASSOCIATED CHAMBERS OF COMMERCE OF THE UNITED KINGDOM, THE.)

CHANCERY, COURT OF.—In 1601 an Act of Parliament gave power to the Lord Chancellor and the Chancellor of the Duchy of Lancaster to make inquiries into the uses to which charitable bequests for educational purposes had been put. In many cases, property given to schools and scholars, or granted for the education of orphans, had been misappropriated; and the Chancery Courts of the two Chancellors enforced orders for the proper execution of trusts as directed by their donors. The Act of 1601 was repealed in 1888, but the Court of Chancery may still be appealed to in disputes concerning educational trusts. The Court gained a bad reputation among lawyers, because its extensive powers were exercised at the Chancellors' discretion and not according to fixed rules. The Court became a byword for delay and expense, which were detrimental to the advancement of English education in the seventeenth and eighteenth centuries. The number of schools improved by the Court during this period was below forty; and, in giving judgment in a case towards the close of the eighteenth century, the judge spoke strongly on the deplorable condition into which grammar schools had fallen, and on the failure of trustees

to apply the endowments to the education of the children for whom they were intended.

CHANNING, WILLIAM ELLERY (1780-1840).—An American preacher and writer. He was minister of a Congregational church in Boston, and became eminent as an eloquent preacher. He wrote largely on social reforms, self-culture, character, and national literature; also advocating temperance, peace, abolition of slavery, and the elevation of the masses. His works were published in five large volumes in 1841.

CHANTRY SCHOOLS (Fr. *chanter*, to sing).—A chantry was a foundation with endowment, of which the proceeds went to one or more priests on whom was laid the obligation to say or *sing* Mass for the soul of the endower or of persons named by him. In many cases, other duties connected with the collegiate church were enjoined upon the priests of the chantries. Among these duties it was required that the incumbents of a chantry foundation should teach gratis the poor "who asked it humbly for the love of God." A chantry school was similar to a cathedral school, and to the monastic schools. The education provided was elementary and higher. In the elementary school, reading, writing, and psalmody were taught; and in the higher, grammar, rhetoric, and dialectics; or, in some cases, all the seven liberal arts (*q.v.*). In both schools the Scriptures were taught. The method of teaching was greatly restricted by the scarcity of books. The master dictated the matter to be learnt, and the pupils wrote not only the text, but also the masters' explanations. The instruction was entirely gratuitous; but when the school was frequented by children of the wealthy, their voluntary gifts to the school, or to the church, enabled the bishop to make provision for the maintenance of poor students.

The suppression of the chantries was carried out by Henry VIII and Edward VI, and among the evils which resulted from their spoliation was the grievous effect on education. The chantry schools had been the grammar schools of the period, and they must have been very numerous, for in 1562 the Commons, in an address to the Queen, referred to the want of schools, and stated that at least a hundred were wanting in England "which before that time had been."

Leach, in *A History of the Chantries of Lancashire*, calls Edward VI the "spoiler" of schools, and says that between 1547 and 1645 no grammar school was founded in England which had not already existed as a chantry. (See also **BENEFACTIONS**, **EDUCATIONAL**.)

CHAPONE, HESTER.—(See "BLUE-STOCKINGS" AND **EDUCATION**, **THE**.)

CHARACTER.—Certain stages in the development of human life are commonly recognized as having a character of their own, as childhood, puberty, youth, manhood, and old age; but many careful and systematic observations on the growth of character in the child are needed before we can begin to transform popular knowledge of them into science. If it is difficult to study a phase of character as it is, it is far more difficult to note its developments. Human character being so complex and elusive, observation and research require to be aided by a preliminary inquiry into its nature and constituents, and the problems facing each of them.

This was the principal aim of the author's work, *The Foundations of Character*.

It may be helpful to divide the development of character from the animal to man into three general stages, which may be named: (1) The stage of Instinct; (2) the stage of Emotion; and (3) the stage of Sentiment. These are not mutually exclusive; but one is usually prominent. In the first, represented by the animal world, instinct is the prominent fact; in the second, represented by the character of the young child, emotion; in the third, represented by the adult, sentiment. The first and second are without what is meant by self-control. In the first, there is a certain balance or organization of the instincts that takes its place; in the second, the external control of parents, nurses, and teachers replaces it; in the third, self-control is formed, first through the habit of obedience to persons in authority, and to the rules and principles emanating from them; and, secondly, through the formation of sentiments, and the growing subordination of proximate ends to their final ends. This stage is also marked by the development of reflection and deliberate will, which are absent from the emotional, impulsive character of the young child.

The Stage of Instinct. The character of animals is constituted by their instincts and what is involved in their instincts. These furnish the animal with the ends at which he aims, and much of the behaviour by which he attains those ends. First, we have to define the meaning of this ambiguous term. By "Instinct," we shall understand an inherited structure of the organism by which an animal manifests a kind of behaviour common to the species to which the animal belongs, and not acquired through experience. Various classifications of instinct may be made according to the purpose we have in view. We may classify them by the function they perform in animal life, as the procuring of food, the defence of the organism, the satisfaction of sex, the nurture of the young. We shall also classify them, with a view to understanding animal character, according to their complexity and comprehensiveness. Among the simplest are the locomotory instincts, as the flight of birds, the sinuous movement of reptiles, the swimming of ducks. These instincts are only serviceable so far as they are constituents of, or are organized in, more complex instincts, as those concerned with the search for food, the defence of the organism, and the nurture of the young. There is some inter-organization among the instincts, and the unity of animal character depends upon it. The bird, when its nest-building instinct is active, flies away innumerable times in search of twigs or other small things to make the nest. The nest once made, this instinct has accomplished its end. But it is linked to others; it is not independent. The eggs being laid, and the young hatched, the instincts connected with the feeding and protection of the young follow. Thus the instincts of searching and flight, of nest-building, of defence of the young, of procuring food for them, are organized together; and that instinct to which they belong is called "the parental instinct." Yet this great instinct only organizes the lesser instincts contained in it, so far as their proximate ends are subordinated to its final end of the preservation of the species, to which even the egoistic instincts must to some extent yield precedence.

If the unity of animal character depends on the organization of the instincts, still the instincts alone do not constitute it. Without the co-operation of

impulses, emotions, and intelligence, it would have no character at all. There may be animals so low in the scale of living beings as not to possess what we understand by character, but where this is present the efficiency of the instincts depends upon it. "Instinctive movements from the outset bring into play whatever mental activity the animal is capable of" (G. F. Stout, *Manual of Psychology*, B. III, Ch. I, 4 [3rd Edition]). In such simple instincts as the grasping of an object, or the pecking at some small thing on the ground, there must be an adjustment to the varying distance and position of the object, which is effected by attending to it. In the instincts of attack, the enemy has to be closely watched; and where these are unsuccessful, the emotion of anger supports them with its impetuous force. The instincts furnish only what is specific in the resulting behaviour; the intelligence and character, operating in ever-changing situations, furnish what is individual and distinctive. There is, indeed, a specific intelligence and character. An animal has the character of his species; but he is more than this. If the intelligence and character support the instincts, and adapt them to changes of situation, what is distinctive in them gives individuality to the behaviour. Thus the Peckhams, in observing different specimens of the wasp *Ammophila*, noticed that one, in making its nest, "wedged two or three pellets into the top of the hole, kicked in a little dust, and then smoothed the surface over, finishing all within five minutes. This one seemed possessed by a spirit of bustle and hurry. The other, on the contrary, was an artist, an idealist. She worked for an hour, first filling the neck of the burrow with fine earth, which was jammed down with much energy—this part of the work being accompanied by a loud and cheerful humming—and next arranging the surface of the ground with scrupulous care, and sweeping every particle of dust to a distance" (G. W. and E. G. Peckham, *Wasps, Solitary and Social*, Ch. II). Even then she was not satisfied, hunting for some fitting object to crown the whole, and tried to drag a withered leaf and failed, then a stone, which was too heavy; "lastly, seizing another dry leaf, she carried it successfully to the spot" (*ibid.*).

Here we have a description, not merely of a nest-building instinct, but of the intelligence and character of the animal in combination with it. And this character, unlike the instinct, possesses individuality; but, like the instinct, appears to be innately determined. Two qualities can be distinguished in this character: one, the quality of persevering in the face of obstacles and failures; the other, the quality of doing the work as well as it can be done. The first wasp, on the contrary, showed little perseverance, and the quality of its work was slovenly and inefficient.

Popular descriptions of character are largely made up of qualities such as these; of doing our work well or ill; of industry, of perseverance, of courage and their opposites; but what are these qualities, and what do they imply? The quality of doing well the work that we have to do implies, in the case of an animal, lacking ideals and self-control, not only the impulse to do the work, but to do it in this way, and that the impulse persists until this twofold end is attained. It implies further, as a condition of this persistency, the force to exclude opposite impulses. The animal that does its work badly does not exclude them. The quality

of "perseverance" implies both force and persistency of impulse and something more. An impulse may be persistent without having perseverance in the presence of obstacles and failures. There are men who will not undertake laborious and disheartening work to attain their ends, being indolent and easily discouraged. Yet their desires persist, and they lament the ill-success of them, expecting others to exert on their behalf the trouble they will not expend themselves. Thus perseverance, besides persistency of impulse, implies the qualities of industry and courage. These qualities and their opposites are of fundamental importance for the interpretation of character and, when they are inbred, we call them "tempers"; and in their combination they make the temperament. There is a temper that cannot be satisfied by anything short of doing the best work, which implies a temperament persistent, persevering, courageous, cheerful, industrious, and energetic.

These several tempers, or their opposites, appear to be as much part of our innate constitution as our instincts, though liable to be greatly modified by our health, training and experience. They subsist in different degrees in everyone; the degree of courage, perseverance, and industry of some men is so small that it is on the verge of its opposite. They bear on the solution of this problem: what and how much our impulses and desires can do to fulfil their ends. Yet we cannot expect every desire to manifest them equally; but in proportion to its strength or importance. There seems to be a law that every strong sentiment tends to acquire the qualities it needs. The patriotism of the great French nation in the Great War enabled it to acquire qualities that were even held to be opposed to its temperament.

Besides these natural tempers, there are others that do not attach to the active side of our nature, but to the side that feels and is, in comparison, passive. For we are more disposed to certain emotions than others, to joy or sorrow, to hope or despondency, to anger or fear.

Character is thus constituted at this first stage by all those dispositions of an animal that yield their characteristic instincts, impulses and emotions, with the tempers distinguishing them. This, with the degree and quality of the intelligence is the innate base; and the acquired character is built upon it, through experience, trial, failure, and imitation. The entire character and intelligence of an animal are, at this first stage, the mere servants of the instincts, and organized by their biological end of survival.

We are now in a position to define the problems facing this simplest stage of character. These are to investigate the instincts, impulses, and emotions of an animal, and the tempers distinguishing them, with special reference to their tendencies and ends, inferring what they are through observation of animal behaviour, aided by suitable hypotheses.

The Stage of Emotion. In the second stage of character, dominated by emotion, and represented by children and those who have not attained to, or have lost, self-control, instinct, instead of striking the eye everywhere, is masked by the variety of acquired factors; but the emotions of joy and sorrow, fear and anger, repugnance, curiosity, and wonder are prominent and constantly manifested. In place of the instincts nearly perfect at birth of many animals, there are here only imperfect or fragmentary instincts. The young child cannot hold a

moving object in the field of vision, cannot walk, cannot find the way to the breast; and these complex actions, except certain fragments of them, have to be acquired in the way of growth and experience. If we choose to call the appetites and emotions themselves instincts, we do not alter the facts. For their instinctive methods are inefficient, and only become efficient after many attempts and failures, and the accumulation of the results of experience. This is the plain contrast between the young child and the animal. He acquires much more through experience, and puts to far greater profit the methods of experimentation and imitation. The one starts from little to gain much; the other starts from much, and gains little. Thus the child overtakes the advantage the animal has at birth, because with his ineffective instincts he depends so much on what he can acquire.

There is a striking difference between the method of experimentation and the instincts. While both serve the ends of the appetites and emotions, the former accomplishes these ends much more slowly than the latter. The child slowly learns, and makes many mistakes; the animal knows its lesson from the beginning, and makes comparatively few. The impulses of the child must, therefore, be much more often obstructed and delayed than those of the animal. In proportion as impulses are obstructed and delayed, while still persisting, they tend to arouse emotions. The impulses of attack and flight may attain their ends so rapidly as only to be accompanied, at the most, by a faint emotion; but obstruct and delay them, and the emotion becomes intense. Hence the child, through this frequent obstruction and delay, must tend to feel emotions more frequently and intensely than the animal.

There is a second influence that increases the emotional character of the child. Possessing a superior intelligence to the animal, and ever striving to acquire through experience, he stores his mind with images and ideas. Besides his outward life, he develops an inward life; and the more intellectual he becomes, the more he lives in it. In contrast with him, animals seem to possess few ideas. They have not, with rare exceptions, that expression, so frequent on the human countenance, of being absorbed in thought. Ideas, and especially images, increase incalculably the number of emotions felt, and prolong their duration. Hence from this cause, too, the child becomes more emotional than the animal.

There is a third cause that contributes to the same effect. The child lacks self-control; and therefore the present emotion takes possession of him. Hence the character of the child is emotional, in the sense that his emotions are more frequent, intense, and engrossing than those of animals and most adults. With these dangerous forces within him, and without the finely balanced character of the animal, he would soon destroy himself were he not under the constant care of his elders.

Many other characteristics are connected with this central one of the child. From his dependence on others, he lacks self-reliance, and in all difficulties and dangers must have recourse to them. He, therefore, lacks self-respect, which springs from self-reliance and independence. His dependent situation, and the teaching to which he is subjected, often instil into him respect or reverence for those set over him, with willing obedience, gratitude, and affection. The opposite type is common where the child is loved and valued, but lacks discipline.

Impressed with his importance, receiving much, but doing little in return, he comes to regard the flow of benefits without surprise, as a natural law. Ingratitude develops, with a growing hardness to affection, with disrespect for authority, with contempt for rules and principles, and in place of love for the home, a repugnance bordering on hate.

The school teaches the boy self-reliance and self-respect by withdrawing him for a time from the protecting care of parents. He has to fight for independence, and to compel other boys to respect him. Through fear of contempt, he learns to control the fear of danger and the expression of pain. In this way the school, where a boy is not timid by nature, gradually overcomes the emotional character of the child through developing the self-controlled, self-respecting, and independent character of the man.

The problems suggested by our conception of this second stage of character must now be defined: (1) Systematic observation of the behaviour of the emotions, and the changes of this behaviour from the first inefficiency of the instincts to the efficiency slowly acquired through experience and growth; (2) investigation of the innate tempers of the child, since these are the base of its individual character; (3) the development of the secondary emotions active at this stage, and the growth of sentiments—such as respect, gratitude, pity, reverence, pride and contempt, vanity and shame—and the slow growth of the will, as shown in self-control, self-reliance, and self-respect.

The Stage of Sentiment. The constitution of character in the third stage, which is represented in the adult human being, is fundamentally the same as in the child and the animal; but is marked by the number and predominance of the sentiments with their reflection, self-control, and deliberate will. The animal appears to live in a succession of impulses and occasional emotions, passing from the impulse of one instinct to the impulse of another without needing to control either, each being evoked in the appropriate situation by the appropriate stimulus. If these instincts are efficient in respect of their immediate ends, and organized together for the supreme end of the survival of the species, the animal does not need to pre-conceive this end in thought, so as to control by means of such conception his subsidiary instincts; for the whole process works well without it. In man, through the invention of new ends, and the inadequacy of the instincts for attaining them, such pre-conception is necessary, as well as the conscious pursuit of the requisite means. For though he may still save his life by an instinctive act, instinct would avail him little to make a fortune or write a book. Further, for the sustained and arduous pursuit of his principal ends, and because of the emotions that deflect him from them, he must acquire self-control. Hence the necessity for him, though not for the animals, of developing foresight and the higher forms of will.

Man's character is further distinguished by the great number of his sentiments—as those for wealth, power, glory, truth, beauty, pleasure, happiness, and goodness—which create new values and new ends unknown to the animals. For these, where they attain to sentiments, seem confined for the most part to two—the love of offspring, and the occasional love between male and female.

Man is further distinguished by the possession of a group of sentiments whose function is to regulate his character. While each sentiment tends

to develop self-control, this relates only to the means to its end, not to the end itself. Yet this end often needs control. If we class all sentiments as particular, abstract, or collective, we may observe how some claim to control others. Thus the collective sentiment for the family claims to control the love between husband and wife; the collective sentiment for country, to control even the love of the family. There are other sentiments whose claim is higher still and more general. Their one or principal end is to uphold the august laws which regulate human life. These are the Conscience, the sentiment of Honour, and the sentiment of Religion. It is a triumph of national character when patriotism is subjected, even in war, to conscience, honour, or religion, and a clear proof of national degradation when patriotism is raised above them.

The problems that have particularly to be dealt with at this stage specially concern the growth and decline of different classes of sentiments. These embrace particular sentiments for parent, child, and friend; abstract sentiments for truth, beauty, and goodness; collective sentiments for family, country, and mankind; and the great regulative sentiments for conscience, honour, and religion. As the strength of a sentiment is largely dependent on the value placed on its object, changes of value have to be observed, according as they are determined by the sentiment itself, by competing sentiments, or by the approval or condemnation of one of the great regulative sentiments.

In conclusion, we may sum up a principal difference between animal and human character. The character of an animal is subordinated to the biological ends of its instincts. The great achievement of human nature is the subordination of the instincts to the ends of character; and this is made possible by the development of those specially human sentiments which value nobleness of character above life itself.

A. F. S.

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CHARITABLE TRUSTS.—Trusts for educational purposes appear quite early in our educational history, though the private founder does not arise until the fourteenth century (cf. 1384: Lady Berkeley's School at Wotton-under-Edge). The control of foundations created for educational purposes seems to have been in the hands of the King's Court and not of the ecclesiastical courts from, at any rate, the fourteenth century. Thus, in 1343, there is a case of prohibition from the Crown directing the Ecclesiastical Court to remit to the King's Court pleas relating to the patronage of grammar schools (*Registrum Brevium*, Fol. 35).

Growth of State Intervention. From this time forward State intervention in education became not unusual, and the power to intervene was undoubted. After the Reformation, when it had become a usual thing for private founders to

endow religious or educational or other charitable institutions, Parliament became active. In 1554, during the reign of Queen Mary I, there was an Act (1 Mary I, Sess. iii, c. 9) for the government of grammar schools, and in the first year of Elizabeth an Act for the regulation of Royal schools, while some special schools were regulated by special statutes. The Sevenoaks Grammar School is an example of this (founded by letters patent, 2 Eliz., July 1; regulated by Statute 39 Eliz. See *Certiorari Roll*, Bundle 8, No. 67—Record Office). In order to deal generally with abuses in endowments, including educational endowments, commissioners for charitable uses were appointed pursuant to statutes 39 Eliz. c. 6 and 43 Eliz. c. 4, with power to inquire into abuses of charitable bequests or donations and to rectify the same on decree. The Elizabethan Act creating these commissioners was not repealed until 1888, and some thirty-three schools were reformed by this method. There was in the mid-Elizabethan age considerable corruption in the administration of educational charitable foundations. Something was done by statute (18 Eliz. c. 6) in 1576 and again in 1589 (31 Eliz. c. 6) to attack the evil, and with so considerable a measure of success that the foundations, whether of university or school rank, were not only cleansed but filled to overflowing with scholars. But dark days for both university and secondary education followed the restoration of the Stuarts in 1660, and it was not until the reign of Queen Victoria that the darkness which so long had afflicted endowed education began to lift.

Acts of the Nineteenth Century. In 1840, an Act was passed for improving the condition and extending the benefits of grammar schools (3 & 4 Vict. c. 77); in 1853 came the Charitable Trusts Act (16 & 17 Vict. c. 137) to provide means for securing the due administration of charitable trusts under which the Charity Commissioners became (until 1899) the authority chiefly responsible for endowed schools. In 1899 the new Board of Education secured (62 & 63 Vict. c. 33) these powers of the commissioners. The Act of 1853 was amended in 1855 (18 & 19 Vict. c. 124). In 1860 an Act was passed to amend the law relating to Roman Catholic Charities. In 1860 came a third Charitable Trusts Act (23 & 24 Vict. c. 136) amending the law relating to the administration of endowed charities and making (by Section 14) masters and mistresses of endowed schools removable. The Public Schools Act, 1868, dealt with certain well-known schools and their ancient endowments: Eton, Winchester, Westminster, Charterhouse, Harrow, Rugby, and Shrewsbury. Further reforms were introduced by the Charitable Trusts Acts of 1862, 1869, 1887, 1891 (for facilitating the recovery of moneys owing to charities) while the Mortmain and Charitable Uses Act, 1891 (54 & 55 Vict. c. 73) had large educational values. The Endowed Schools Acts, 1860, 1868 and 1869, and further acts to 1889 which, in fact, centre round the Act of 1869 (32 & 33 Vict. c. 6), marked the opening of a new stage in the history of higher education in England. The Act of 1869 amended the law relating to endowed schools and other educational endowments in England, and otherwise provided for the advancement of education. It was under this Act that old foundations and charitable trusts were extended from the education of boys to that of girls. During the decade ending 1880 many important girls' schools were created

out of these ancient endowments and were thus able to enter into the tradition of education going back far into the Middle Ages.

The history of charitable trusts for education from 1869 to 1918 (including the Welsh Intermediate Education Act, 1889) has been a record of constant progress by means of legislation, Orders in Council, administrative acts by the Charity Commissioners, the Board of Education and the local education authorities created by the Education Act, 1902, continually aiming at making ancient and modern charitable trusts more efficient for the education of boys and girls and young people.

J. E. G. DE M.

CHARITY SCHOOLS, WORK OF THE.—Schools which clothed as well as taught their pupils were the peculiar contribution of the eighteenth century to the education of the poor. Most of them, directly or indirectly, owed their being to the Society for Promoting Christian Knowledge, which, at its first meeting (on 8th Mar., 1699), resolved that it would consider "how to further and promote that good design of erecting Catechetical Schools in each parish in and about London." On the 10th it resolved to "subscribe a stock for insurance of the charge of setting up" such schools, thus indicating at the outset the principle consistently followed throughout: that the Society should stimulate, advise, and aid local effort, but should not make itself responsible for the establishment, support, or management of local schools. By the form of subscription (submitted on 16th Mar.), the signatories promised to pay so much a year "towards the setting up a school within this parish for teaching poor children (whose parents are not able to afford them any education) to read and write, and to repeat and understand the Church Catechism according to the rules and orders lately printed and published by the direction" of the Society.

The model rules prescribed that the master must be "a member of the Church of England, of a sober life and conversation, and not under the age of 25 years; one that frequents the Holy Communion; one that hath a good government of himself and passions; one of a meek temper and humble behaviour; one of a good genius for teaching; one who understands well the grounds and principles of the Christian religion; . . . one who can write a good hand, and who understands the grounds of arithmetic; one who keeps good orders in his family." Mistresses were, of course, required to have the same qualifications. The model orders prescribed that the school hours were to be "from 7 to 11 in the morning, and from 1 to 5 in the evening the summer half-year." In the winter half-year, school opened an hour later and closed an hour earlier. The master was to instruct the pupils in the principles of the Christian religion "as they are laid down in the Church Catechism, which he shall first teach them to pronounce distinctly and plainly, and then in order to practise, shall explain it to the meanest capacity . . . and this shall be done constantly twice a week." The pupils were also to be taught "to spell and read well in the Bible, and afterwards to write and cast account as they are capable in order to qualify them for service or apprenticeship." "The master shall bring the children to church twice every Lord's Day and Holy Day." "The children shall wear their caps, bands, clothes, and other marks of distinction every day, whereby the trustees and

benefactors may know them, and see what their behaviour is abroad."

In 1709, "the ordinary charge of a school in London for fifty boys clothed comes to about £75 per annum; for which a schoolroom, books, and firing are provided, a master paid, and to each boy is given yearly three bands, one cap, one coat, one pair of stockings, and one pair of shoes." The cost of a similar school for girls was £60. Their garments were "two coifs, two bands, one gown and petticoat, one pair of knit gloves, one pair of stockings and two pair of shoes."

The Society had regarded subscriptions (supplemented by regular church collections) as the most likely source of income for the schools, but endowments soon proved to be a richer source. There is no record of the number of such endowments, but the Charity Commissioners found existing, in 1842, after inevitable appropriations and misappropriations, 1,241 "non-classical" schools which had been endowed in the eighteenth century. Efforts to diffuse a little light alarmed the owls of society. One of them became vocal in 1714, when a volume appeared, entitled *The Fable of the Bees; with an Essay on Charity and Charity Schools*. The second edition was in two volumes, and the fact that six editions were called for by 1732 proves that a good many others shared the opinions of the author (Bernard Mandeville). He argued that the schools would not promote religion because "the most knowing and polite part of a nation have everywhere the least of it," and "ignorance is, to a proverb, counted the mother of devotion." They would not promote good manners, because "the master is not greatly qualified, as may be guessed by his salary; and, if he could teach . . . manners, he has not time for it." They might teach reading and writing, but these are acquirements which only unfit the poor for their proper work, and puff them up with conceit.

Notwithstanding the objections urged, the schools continued to increase in number, for the people who thought the criticisms fallacious kept on subscribing, and the people who thought the criticisms sound never had subscribed. The following figures show the progress made—

	1709.	1720.	1746.
NUMBER OF SCHOOLS—			
In London and Westminster . . .	88	131	146
In England . . .	254	1,097	1,258
In Wales . . .	25	57	71
NUMBER OF PUPILS—			
<i>In London and Westminster—</i>			
Boys . . .	2,181	3,166	3,426
Girls . . .	1,221	1,986	2,049
	3,402	5,152	5,475
<i>In England—</i>			
Boys . . .	—	16,662	18,479
Girls . . .	—	3,212	3,779
	—	19,874	22,258
<i>In Wales—</i>			
Boys . . .	—	633	1,027
Girls . . .	—	79	136
	—	712	1,163
Total number of pupils —	—	25,738	28,896

Detailed figures for a later date are not available; but Mrs. Trimmer, writing in 1792, says: "It appears from the account of Charity Schools given by the Society for the Propagation of Christian Knowledge, that there have been no less than 1,631 of these schools established in Great Britain since the Reformation, in which, allowing for the deficiency occasioned by some of them having been suffered to drop, there are some 40,000 children educated annually."

Charity Schools of the Nonconformists. Besides these Church schools, there were some Dissenting schools, though Nonconformists were comparatively few, and they had no central body to stimulate and direct their zeal. The school in Gravel Lane, Southwark, had been established as early as 1687; and the suspicion (not altogether unfounded) that some of the Church schools were hostile to the Protestant succession, led to the establishment of more Dissenting schools. There are no statistics respecting these; but from the endowments which the Charity Commissioners found existing in 1842 it may be inferred that there were, in the eighteenth century, about sixty Dissenting schools, educating about two thousand children. By the end of the century, a good many of the Church schools had lost something of their first character. Mrs. Trimmer, writing in 1792, says: "Notwithstanding the plan is still in force which was originally concerted for the purpose of giving the children educated by charity a comprehensive knowledge of the principles of Christianity, and to exercise them betimes to the practice of piety, it must be acknowledged that the education of children brought up in Charity Schools is, in general, very defective in these particulars." The movement had clearly spent its force, zeal for the religious education of the poor being diverted in other directions. Robert Raikes began work in 1780; twelve years later, Mrs. Trimmer says that there were half a million Sunday-school pupils. A Sunday school could be established anywhere at little or no cost; whereas a Charity School could be established only in those places where there was an enlightened, rich, and generous benefactor. Thus, while the Charity *Saul* trained only thousands, the Sunday *David* trained ten thousands. It is true that most of the Sunday schools taught religion only; but the introduction of the monitorial system facilitated the establishment of day schools, in which secular education was also given. The same service which the Society for Promoting Christian Knowledge had rendered in one way the British and Foreign School Society and the National Society (*qq.v.*), a hundred years later, rendered in another way and in ampler measure.¹ D. S.

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¹ I have not mentioned the Welsh Circulating Schools started by Griffith Jones, of Llanddowror, in 1737, because, although he called them "Charity Schools," the name with him denoted not a permanent and endowed institution, but a school conducted for a few months in any available building, and then closed.

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CHARLEMAGNE, SCHOOL REVIVAL UNDER.

—The story of education under the Roman Empire in the first five centuries is one of disputes between Christian and pagan teaching, and the gradual decay of the latter. Christian teachers like Tertullian recommended the faithful to refrain from the study of pagan literature, while the Emperor Julian (A.D. 363) expelled Christian teachers from imperial schools. In these centuries education in the imperial schools gave more prominence to the mere ornaments of pagan culture than to its more intellectual and useful elements, and with Sidonius (430) the attempts to combine classical and Christian culture ended for a long period. The Frankish invasion finally overthrew the last remains of Roman education in Gaul.

Cassian Monastic Schools. Christianity, however, achieved a conquest over the invader, and the monastic schools of Cassian became the preservers of letters and the teachers of the people. The teaching of the monks appealed strongly to the nature of the Franks, and in the fifth and sixth centuries monasticism in Gaul made rapid progress. The education was still of the narrowest kind—reading was taught that the boys might read the Bible and understand the services; writing, that they might copy the sacred books and the Psalter; music, that they might give effect to the Ambrosian chant. Arithmetic was limited to instruction which enabled boys to calculate the return of Easter and other Church festivals. Theological learning rapidly declined in these schools, and Gregory of Tours (544–595) sadly lamented its decay. The servile element was strong in the monasteries, and little was done to elevate it. St. Boniface was chiefly instrumental in commencing the revival of learning in the eighth century by establishing stricter monastic discipline and closer unity between Gaul and Rome.

Charles the Great and Education. With the revival of discipline came the revival of learning, and Charles the Great came to the throne opportunely in 768 with the intention of reconstructing education. In the same year he met Alcuin at Parma, and induced him to reside at the Imperial Court at Aachen and to conduct the regular education of the youth of the imperial court in the Palace School. The pupils Alcuin had to instruct included Charles himself and practically every member of his family, and the system was that of dialogue, which developed into disputation. Alcuin's ignorance of philosophy and his limited Greek scholarship were counterbalanced by his superiority as a grammarian; but he found himself quite unable to satisfy the demands of his pupils, whose questions he could not always answer to their satisfaction. Charles, however, put two important monasteries under Alcuin's control, and in 787 issued a famous Capitulary to all his bishops and abbots, in which he required them to choose men "able and willing to learn, and also desirous of instructing others." To raise the standard of the priesthood, he enjoined

that candidates should be taken from the sons of freemen, and he insisted that every abbey should have a school where boys should be taught the Psalms, musical notation, singing, arithmetic, and grammar; and he added, "Let the books which are given them be free from faults." In 794, Alcuin took charge of the abbey at Tours, and its monastic school and the fame of his teaching drew pupils from far and near. Clement of Ireland took charge of the palace school at Tours, and for the remaining ten years of Charles's reign educational reform was pressed on with vigour. The work of Charles was continued by his son Lewis; and though the school at Tours declined, many famous monastic schools arose, those at Orleans and Reims standing out as two great centres of Christian education.

CHARTERED INSTITUTE OF SECRETARIES, THE.—This was founded in 1891 and incorporated by Royal Charter in 1902. Its primary object is "to devise and impose means of testing the qualifications of candidates for admission to the professional membership of the Institute by examination or other tests, and to grant certificates of qualification." Conferences are held for the discussion of professional matters, lists and registers of secretaries are compiled, and information of interest is circulated to members of the profession and to the public. The Institute watches over the interests of its members, and endeavours to secure for them a definite and useful professional standing. The members consist of Fellows (F.C.I.S.) and Associates (A.C.I.S.), each of whom may describe himself as a chartered secretary.

For admission to the Institute, a candidate, not under 16 years of age, must pass the Preliminary Examination. From this, candidates may be exempted if they are graduates of any university in the United Kingdom, or have passed certain examinations of the standard of the London University Matriculation.

The Intermediate or Associates' examination may be taken by candidates over 21 years of age who have been engaged in the offices of public companies, public authorities or bodies, societies or institutions for at least six years, provided they have passed the Preliminary Examination or have been exempted.

The Final or Fellows' Examination is open to candidates of 25 years of age who have had eight years' experience as secretary. The subjects are of the same nature as those of the Intermediate Examination.

All the examinations are held in June and December at various centres; and the dates are announced in *The Secretary*, in which also the lists of successful candidates are published.

Students who have passed the Preliminary Examination may, between the ages of 16, 17, and 30 years, be registered for an annual fee, and are expected to take the Intermediate examination within five years. For their benefit, the Chartered Secretaries Students' Society arranges meetings to promote the study of professional subjects, and to further the general interests of the students.

The library and reading-room are open daily from 9.30 to 6.30 (Saturdays, 2), at 59A London Wall, E.C.2, the office of the Institute.

CHARTERHOUSE SCHOOL.—In 1371 a Carthusian monastery was established outside the

walls of the City of London beside Smithfield. It existed until the Dissolution by Henry VIII, who made a storehouse of it for his nets and pavilions; later, it passed into the hands of other owners, and about 1609 the Earl of Suffolk sold it to Sir Thomas Sutton, of Castle Camps, Cambridgeshire, a rich London merchant. Sutton had procured an Act of Parliament authorizing him to establish a hospital and grammar school at Hallingbury, Essex, but the suitability of his new property induced him to obtain letters patent empowering him to erect his foundation in the old monastic buildings. In 1611 he appointed sixteen trustees, and conveyed to them twenty estates in various parts of England to serve as an endowment. The hospital is an almshouse for eighty "poor brethren," who each receive £36 a year, besides maintenance, attendance, and a private apartment. Each poor brother, on election, must be over fifty years of age and must have been a householder. They are lodged in the old buildings, of which the hall, chapel and hospital still remain. The school was removed to Godalming, Surrey, in 1872, where it occupies new premises erected from the designs of Hardwick. The main building surrounds a spacious quadrangle, with a handsome gatehouse-tower. The old site in Charterhouse Square was sold to the Merchant Taylors' Company, and their London school now stands there in new buildings. Charterhouse School is a wealthy foundation: there are thirty junior or entrance scholarships, each of £76 10s., held for two years by boys of 12–14 years; and thirty senior scholarships, each of £96 10s., for boys of 14–16 years; there are also five leaving exhibitions of £80 for four years, tenable at the university or elsewhere. The school has always enjoyed a high reputation both for scholarship and for skill in athletics; there are the usual classical and modern sides, Army classes, and a special course in engineering. At present it contains close on 600 boys, who live in eleven boarding-houses conducted by masters. Among distinguished Old Carthusians are Blackstone, Steele, Addison, John Wesley, Leech, and Thackeray.

CHARTRES, SCHOOL OF.—Chartres, on the Eure (France), was famous in the Middle Ages for its cathedral, founded about 1091, and its school established some hundred years earlier. The school became widely known under Fulbert, Bishop of Chartres, who had practised medicine, and was also poet, mathematician, theologian, grammarian, and skilled musician; so when he became head of the school, scholars flocked to listen to him. Like Plato, he often taught in his garden, surrounded by chosen pupils, expounding philosophy and theology. Among those who learnt from him were Lanfranc, Walter of Burgundy, and Engelbert of Paris. From Fulbert's time, the school was famous also for its music and its plain-song rendering of the sacred offices. In the twelfth century, Bernard Silvester made the school a centre for classical teaching; while François of Cologne is mentioned as having been a pupil there. The reputation and popularity of the school as a home of classical teaching continued till the Renaissance, which in the sixteenth century drew scholars to Paris.

CHATELET, MME. DU.—(See "BLUE-STOCKINGS" AND EDUCATION, THE.)

CHAUER IN THE SCHOOL.—The following remarks are framed principally from the point of

view of linguistic study, and apply to the study of Chaucer as representing an important phase in the development of English. (See section *Language of Our Older Literature* in article ENGLISH IN THE SCHOOL, HISTORICAL TEACHING OF.) The consideration of Chaucer as poetry falls fittingly under the teaching of literature. From whatever point of view the works of Chaucer be dealt with in the school, it is very important to have a reliable text with an adequate grammatical introduction, account of the pronunciation, and a good glossary. The teacher will see to it that the selected passage be very systematically studied, and the first point to note is the careful interpretation of the text, so that the meaning is perfectly clear. When the meaning of the words, and the force of the unfamiliar grammatical forms, in a short passage, have been explained, this should be read and re-read, in the actual form in which it occurs, without translating it into present-day English, so that the class can really be said to *read Chaucer*, and not merely to listen to an inferior modernization of him.

It is very essential to insist, from the start, upon an approximately correct pronunciation and accentuation; and this must be consistently carried out, each member of the class being accustomed to frequent reading aloud of a few lines at a time. They should also be encouraged to learn passages by heart, and repeat them aloud, paying careful attention to the pronunciation; and in particular to the *quality* and *quantity* of the vowels, the proper stresses, and the just scansion of the lines. It will at once become apparent that the metre demands the audible pronunciation of many final flexional syllables which have now been lost, and also an accentuation of many words of Norman-French origin, different from that now in use.

Linguistic Study. When the meaning and proper oral rendering of the text have been mastered, the passage may be made the basis of a thorough linguistic study. It is desirable to study separately the grammatical forms and the vocabulary. The class should construct for themselves a short grammar from the text, collecting and arranging all the forms of the various parts of speech. The same thing should be done for the vocabulary, the elements of which, by the aid of a good glossary, may be arranged in lists according to their origin: original English, Scandinavian, Norman-French, Latin, and so on.

Then the teacher should compare each detail of accidence and vocabulary with present-day English, and point out the relations of Chaucer's forms to our own. Of the grammatical forms, some are the direct ancestors of our forms; others have disappeared, and their places have been taken by new forms derived by a new analogy. This is particularly the case with the strong verbs, and the pronouns. In every case, the teacher should endeavour to show how the modern forms have arisen. It may be desirable, from time to time, to supply the Old English ("Anglo-Saxon") forms, and in this the teacher must use his own discretion.

Passing to the vocabulary, by the side of a classification according to origin, another classification may be made according to whether the elements have survived or been lost. If the former, has the word preserved its old meaning, or altered it? If the latter, what word has taken its place in common use? Proverbial and idiomatic phrases that occur should be carefully noted. (See, further,

ENGLISH IN THE SCHOOL, HISTORICAL TEACHING OF : Section, *History of English Sounds*.) H. C. W.

CHAUTAUQUA MOVEMENT, THE.—(See SUMMER SCHOOLS.)

CHECKS ON COMPUTATION.—A check is a test that may be applied to the result of a calculation for the purpose of discovering whether it contains an error. Such a test cannot *prove* that a result is correct, but it may show that it is free from certain errors. All checks depend on elementary principles governing relations between numbers [*e.g.* (1) the sum of even numbers is even; (2) the sum of an even number of odd numbers is even; (3) the sum of an odd number of odd numbers is odd]. Hence, if a column of numbers is added up, the total must be even, unless the number of odd numbers in the column is odd. Again, the product of two odd numbers is odd, all other products are even; thus we know that 373×957 produces an odd number. Casting out the nines (*q.v.*) is often a useful check. Estimating the limits of the magnitude of a result affords simple checks (*e.g.* the product of $3 \cdot 73$ and $95 \cdot 7$ lies between 4×100 and 3×95 ; thus the product cannot be either 35·6961 or 3569·61). In many calculations dealing with money, the relations of coins to one other supply useful checks (*e.g.* £73 17s. $8\frac{1}{2}$ d. \times 73 must contain either 1 or 3 odd farthings; but £73 17s. $8\frac{1}{2}$ d. \times 72 cannot contain any odd farthings, and the pence must be 6, because 72 is three times 24, and 24 farthings make 6d.).

CHEDARIM.—(See TALMUD TORAH SCHOOLS)

CHEEVER, EZEKIEL (1614–1708).—An English university scholar, who went to America in 1637, and opened a grammar school at New Haven. The school was partly supported by public contributions, parents paying according to their ability. Cheever's success in this school led the town of Ipswich, Massachusetts, to put him in charge of a grammar school in 1650; and in 1661 he took charge of a free school at Charlestown. From 1670 until his death he was Principal of Boston High School. His chief educational written work was a Latin school text-book, which was for many years the most popular book of the kind in American schools. Cheever is described by contemporary and later American writers as a most skilful teacher, and each of his schools became famous throughout Massachusetts.

CHEKE, SIR JOHN (1514–1547).—One of the scholars associated with the revival of Greek learning in England. He was born and educated at Cambridge, where he devoted his mind to the study of Greek language and literature, and introduced a new method of pronouncing Greek. He became tutor to Prince Edward in 1544, and was made provost of King's College. Having actively advocated the reformed doctrines, he was deprived of his property and honours in Mary's reign. He went abroad, but was seized in the Netherlands and brought back to London, where fear of the stake led him to recant and to profess the Catholic faith. His most important work is a translation of St. Matthew's Gospel, in which he exemplified a plan for improving the language by removing all foreign words.

CHELSEA COLLEGE.—This was founded in the reign of King James I. The site, consisting of 6 acres, was obtained on lease for an annual rent of £7 10s. James gave all the necessary timber from Windsor Forest. The object of the College was for "the defence of the true religion established within the realm, and for the refuting of errors and heresies." Its aim was to form a training college for protagonists of the Anglican Church against Roman Catholics. The Provost was Dr. Sutcliffe, Dean of Exeter; seventeen Fellows, all divines, were appointed, and two "historians," one of whom was William Camden, the Clarencieux King-of-Arms. In 1610 an Act of Parliament was passed to enable the College "to dig a trench out of the river Lea to supply London with water by pipes underground, all rents to go to the College." In 1616, King James directed the Archbishop of Canterbury "to stir up all the clergy for a liberal contribution in support of the College," but the appeal received slight response. The College was a "spiritual garrison, with a magazine of all books for that purpose." Dr. Featley, appointed 1630, was the third and last Provost. This College was suggested for the Pansophical College of Comenius (*q.v.*) when he was called over to England, in 1641, to be a "Universal College of all nations." In 1652, the same College was suggested by Hartlib to Parliament for the home of his scheme of a bureau of international inquiries in religion and learning. In 1660, the Earl of Newport had a promise of the change of the College into a Hospital. Nevertheless, King Charles II gave it to the Royal Society, and then bought it back and founded it as a hospital "for emerited soldiers." The re-building of it for this purpose was placed in the hands of Sir Christopher Wren (1681–1682). One of the suggestions in connection with the original College is of special educational interest, though it was not carried into effect. Samuel Jenyns wrote to the actor Edward Alleyn (*q.v.*) expressing the hope that Alleyn would help Sutcliffe in the Chelsea College project. It suggests to Alleyn the provision of a hostel for schoolmasters and other strangers visiting London: "Or yf I might move another project to your self that it would please you to build some half a score lodging roomes, more or less neere unto you, yf it be no more but to give lodging to divers schollers that come from the University. Some would be ministers and some schoolmasters, and for want of meanes to staye here about London till they could be provided, they are forced to go away again and to lose all opportunities that might fall out. If they had chamber roomes, which here in London is hard and costly, diet would be more easy, and so either by preaching they might put forth themselves, or by hearkening how they might place themselves to teach scholars, they might have help till some preferment might be obtained. Amongst those lodgings, yf it pleased you, you might build a library and furnish it with some books, now some, then some, as you saw cause, as might be very beneficial not only for strangers, but for those that are maintained by you." F. W.

CHELTHENHAM COLLEGE.—The first of the great public schools founded during the reign of Queen Victoria was Cheltenham, which, dating as a proprietary school from 1841, was incorporated by Act of Parliament in 1894. It was established "to provide an education of the highest order, in

strict conformity with the principles and doctrines of the United Church of England and Ireland"; and religious instruction forms a regular part of the teaching of each form. The school consists of two departments: senior and junior. The latter contains boys from 7 to 13 or 14 years of age, who are housed in separate buildings apart from the older boys, and have their own playing-field; special preparation for Osborne is given in this department. The senior department is divided into three sides: Classical, military and civil, and modern. There are upwards of 600 boys and an exceedingly large number of masters, the proportion of boys to masters being maintained at 17 to 1. The boarding-houses are of two classes: (1) College boarding-houses and (2) private boarding-houses, which are smaller and more expensive; one of the latter is a special house for Jewish boys. There are about fifteen entrance scholarships awarded annually, ranging from £20 to £80 in value; and there are at least seven leaving scholarships of from £25 to £75 a year, tenable for two, three, or four years at one of the universities.

CHELTHENHAM LADIES' COLLEGE, HISTORY AND WORK OF THE.

Sixty-seven years ago, in a very humble way, the Ladies' College came into being, the opening of Queen's College in 1848 having already begun a movement for the better education of women. The founding of the Ladies' College was chiefly due to the Rev. W. Dobson, Principal of Cheltenham College; and the Rev. H. Walford Bellairs, then H.M. Inspector of Schools for Gloucestershire, and, later, Hon. Canon of Worcester. Their scheme was for "A Proprietary College for the education of young ladies and children under eight years of age." It was for day-pupils, and only "ladies," in the Victorian sense of the term, were to be admitted. The fees were six to twenty guineas per annum, and the curriculum, though sound, was unambitious. The required capital was subscribed by a small body of interested enthusiasts.

Miss Annie Proctor, associated with her widowed mother, was the first Principal; and on 13th Feb., 1854, the school was opened, with eighty-eight pupils, in a large private residence still known as Cambray House.

Under Miss Beale. In 1858, Miss Proctor resigned; and Miss Dorothea Beale (aged 27) (*q.v.*) was appointed. For five years she had held a post on the staff of Queen's College, and had also taught for a short time at Casterton. During these apprentice years, she learned to recognize teaching as her vocation; and, through teaching, it was her aim to raise, both mentally and morally, the whole status of women. She devoted her life to this; and, from 1858, the history of the Ladies' College becomes one with the life-history of Miss Beale. Sixteen years of steady growth followed: increased numbers, an extended curriculum, and structural additions to Cambray House resulted.

In 1873, the original Ladies' College was erected on its present site. It consisted of one large hall (80-ft. by 30 ft.), flanked by class-rooms, with a few music-rooms on an upper floor. It was designed to accommodate 220; and on 17th March, 1873, the 150 pupils from Cambray were transferred to the new building.

In 1880, the proprietors, at first a voluntary association, were legally registered as a company, and the constitution was re-modelled.

In 1883, on the occasion of Miss Beale's "Silver

Wedding" with her College, an association was formed of old pupils, who are pledged to a life of serious purpose, whether in the home or in public work.

In 1889, their corporate work, a Settlement in East London, was begun; the Guild now numbers over 3,000.

Miss Beale became known as a leader in educational thought and practice, and the influence of her strong personality brought increasing numbers to the College. The growth of the College from 1880 onwards was rapid. She remained at her post, still courageously progressive, until her death on 9th November, 1906.

By 1906 the College buildings had so increased as to cover just over an acre. The class-rooms and lecture-rooms were well equipped, and the science department was one of the best in England. There were seventeen boarding-houses for pupils from a distance, and a 16-acre playing-field. The pupils numbered nearly a thousand; the staff, 140. Connected with the College there was a Preparatory School in Cambray House; a hostel, known as St. Hilda's College, for senior students, of whom twenty are foundationers; the enlarged Guild Settlement, known as St. Hilda's, East; and St. Hilda's Hall at Oxford, which was founded in 1893 and incorporated in the University in 1897.

There are four main departments in the College. The First Division consists of elder students, many of whom are prepared for the Cambridge Higher Local, and Oxford and Cambridge Board; and the London B.A. and B.Sc. degrees. In all these examinations, Cheltenham students take a high place. There is a Training department for teachers in secondary schools and in Kindergartens. In the Second Division, girls from twelve to fifteen receive a wide general education. In the Third are girls under twelve, mostly day-pupils; and there is a Kindergarten.

Under Miss Faithfull. In 1907, Miss Lilian Mary Faithfull, M.A. (Dublin), Vice-Principal of the Women's Department of King's College, London, was appointed to succeed Miss Beale. Additions to the buildings and several changes in the curriculum have followed, including a large swimming-bath and a hostel for the staff. As regards curriculum, the direct method of teaching languages has been adopted; training is given for library work, commercial subjects, Sunday-school teaching, and for gardening. In 1913, the Dalcroze system of Eurhythmics was introduced.

The music and art teaching are under the superintendence of separate directors.

In 1909, Red Cross training was introduced, and the next year the students distinguished themselves in the War Office inspection. (See also BEALE, DOROTHEA.) M. I.

CHELTENHAM (ST. MARY'S HALL) TRAINING COLLEGE FOR WOMEN.—This was founded in 1847, and opened with six students, the accommodation being increased for two hundred by subsequent additions. It stands in extensive grounds, and contains well-equipped lecture rooms, a practising kitchen, a science laboratory, and an excellent library. A large and well-qualified staff prepare the students for the Board of Education examinations. In 1904 a hostel was opened at the Priory for Nonconformist students, the College itself being reserved for members of the Church of England. To Mrs. Champney, the superintendent for many

years, was due much of the early success of the College. The Natural History rambles are a feature of the College training. For experience in teaching, the students pay visits to schools in Birmingham, Bristol, and Cardiff. About one hundred and twenty students are in residence, and there are about eighty day students.

CHELTENHAM TRAINING COLLEGE.—This owed its foundation to the efforts of the Rev. Francis Close, afterwards Dean of Carlisle, who, in 1845, proposed the establishment of a training school for supplying Church schoolmasters. In 1847 several houses were taken to accommodate students, and the Rev. C. H. Bromby became the first Principal. Miss Jane Cooke gave land and money, and in 1850 a new building for sixty students was opened. The Rev. R. M. Chamney was Principal from 1865 until 1894, and his work left a permanent mark. He was succeeded by the Rev. H. A. Bren, M.A., when the College went forward even more rapidly. The staff hold high academic qualifications, combined with knowledge of the needs of primary education. In buildings, equipment, and teaching, Cheltenham has long stood in the front rank of training colleges. The Courses include preparation for University examinations and the Board of Education certificates. Accommodation is provided for 120 students.

CHEMICAL INDUSTRY, THE SOCIETY OF.—This was established in 1881 to promote and advance Applied Chemistry and Chemical Engineering in all their branches. It affords its members opportunities of meeting for the interchange of ideas with respect to improvements in the various chemical industries and for the discussion of all matters relating to the applications of chemical science. Information on all these points is collected and published by the Society. The Society was incorporated by Royal Charter in 1907, and has a membership of over 4,000. The first president was Sir Henry Roscoe, and among his successors were Sir Frederick Abel (1882), Sir James Dewar (1887), Sir William Ramsay (1903), and Sir William Crookes (1913).

The Society is managed by a council, among the members of which are the chairmen and secretaries of the sections which it was found necessary to form in consequence of the wide distribution of the members. For the same reason, the annual general meeting is held in a different place each year. Local sections in England have been formed at Nottingham, Newcastle-on-Tyne, Manchester, Liverpool, Birmingham, and London.

Papers read at the meetings of the sections, and the discussions thereon, are published in the *Journal*, which is issued fortnightly. Besides the papers, the *Journal* contains abstracts of patents on chemical and chemical-engineering subjects, lists of patents applied for and granted, articles on applied chemistry, and information affecting chemical industries. It is specially useful to manufacturers, professors, managers of works, inventors, and patent agents in providing them with the latest improvements in technical chemistry. Exhaustive indexes in two volumes have been prepared and published by the Society. These afford a valuable classified record of technical papers, patents, and trade reports. The *Journal* is distributed free of charge to all members.

Candidates for admission to the Society must be 21 years of age, and must be proposed by

at least two members who know them personally. There is an entrance fee and an annual subscription.

The office of the Society is at Broadway Chambers Westminster, London, S.W.1.

CHEMICAL LABORATORY, THE.—(See LABORATORIES, THE EQUIPMENT AND ARRANGEMENT OF.)

CHEMICAL SOCIETY, THE.—Previous to the foundation of the Chemical Society, investigations in chemical science were made by members of the Royal Society and the Society of Arts. The Chemical Society was formed in 1841 by a number of members of the Mathematical Society of Spitalfields, which had in the preceding ten years devoted many of its meetings to lectures on chemical subjects. The Society was at once actively supported by London chemists. The Society was "instituted for the advancement of Chemistry and those branches of science immediately connected with it." For this purpose, periodical meetings are held for the communication and discussion of discoveries and observations relating to such subjects, an account of which is published by the Society in the form of *Transactions and Proceedings*. A library of works relating to chemistry and allied subjects was formed, and during the first fifty years of the Society's existence over 10,000 volumes were collected. Half of these are volumes of journals, and many are pamphlets.

The members at first were classed as ordinary members, foreign members, and associates; and the business of the Society was conducted by the president, vice-presidents, treasurer, secretary, and a council of twelve members.

The first meetings were held in the house of the Society of Arts; but in 1849 a charter of incorporation was obtained, and the Society established itself in its own rooms in Cavendish Square, which it retained until it found accommodation in 1857 at Burlington House. At the Society's rooms are held meetings of the Society of Public Analysts, the London section of the Society of Chemical Industry, the Institute of Chemistry, and the Institute of Brewing.

Fellowships and Lectures. After the incorporation of the Society by Royal Charter, the title of Fellow (F.C.S.) was introduced; and for ten years a distinction was drawn between resident and non-resident Fellows, the latter paying a smaller subscription.

The Associates originally paid no subscription, and were elected for three years only; but, after 1850, Associates paid an annual subscription of £1, or if they paid 30s. they became entitled to the Society's publications.

A candidate for the Fellowship must be proposed by at least five Fellows, of whom three must know the candidate personally, and at least thirty-two Fellows must vote for his election. He is required to sign a declaration that he will endeavour to promote the interests and welfare of the Society, observe its laws, and maintain its dignity as long as he remains a Fellow. An annual subscription and an admission fee must be paid.

The publications of the Chemical Society consist of: *Memoirs and Proceedings*, separately in yearly volumes (1841, 1842, 1843), and together (1844–1847); *Quarterly Journal*, 1847–1864; *Monthly Journal*, 1862–1878; *Monthly Journal and Abstract*,

1871–1877; *Journal, Transactions and Abstracts*, 1878–1891; *Proceedings*, since 1885.

Since 1854 it has been the practice of the Society to add to the interest of the meetings of its members by devoting some of them every year to the delivery of lectures by eminent scientists. In the early years these lectures were very numerous, and were delivered generally by chemists; in recent years they have been fewer, and the lecturers have generally been specialists working in fields more or less beyond the ken of the professed chemists.

Dr. Faraday was a member of the Chemical Society from its first year until his death in 1867. In commemoration of his name and services to science, the Society instituted the Faraday Lectureship in 1868. The Faraday Lecturer is required to deliver a lecture, or lectures, at a time appointed by the council, and to give the manuscript to the secretary for publication in the *Journal*. A medal called the Faraday Medal was struck, bearing an effigy of Faraday, and a copy of the medal in bronze is given to the lecturer. An honorarium of £25 is also presented. The first Faraday lecturer was M. Dumas, who delivered his lecture at the Royal Institution on 17th June, 1869.

In 1868 a Research Fund was established to which Dr. Longstaff and the Goldsmiths' Company each contributed £1,000. Grants are made out of this fund to encourage original research among workers in chemical science. The sum granted to one person is sometimes as much as £50, and in one year as much as £300 has been granted.

CHEMIST, THE EDUCATION OF A.—(See PHARMACEUTICAL PREPARATION AND PROSPECTS.)

CHEMISTRY, THE COLLEGE OF, SOUTH KENSINGTON.—(See IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY, SOUTH KENSINGTON, THE.)

CHEMISTRY, HISTORICAL DEVELOPMENT OF.—Chemistry had its beginnings in efforts to turn the properties of naturally occurring substances to useful account. At what period in the history of human development these attempts were first made is impossible to state. It is certain that chemistry as an art was practised thousands of years before our own era. So remote, in fact, were these beginnings, that certain monkish writers have not scrupled to claim for it a supernatural origin.

The Chemistry of the Egyptians. The oldest chemical treatise known is said to be a papyrus in the possession of the University of Leyden, which gives recipes for working metals and alloys, and for falsifying or imitating gold. It states that certain metals may be blackened by sulphur and others whitened by arsenic; and that by admixture with cadmia, or ore of zinc, the colour of copper may be changed to that of gold. Indeed, we know from the accounts left by Herodotus and other writers that the ancient Egyptians had a considerable knowledge of chemical operations, and their monumental records serve to show that there were adepts among them even in very early periods of their history. The association of the art with Egypt is, moreover, held to be connoted by the very word "chemistry," which by some is considered to be derived from an ancient name of that country. The first known definition of chemistry (χημεία) is to be found in the lexicon of Suidas, a Greek writer of the eleventh century, where it is stated to denote the preparation

of silver and gold from the so-called baser metals. The manufacture of fermented drinks was probably one of the earliest of chemical processes to be practised by men. Wine is stated to have been made by the Chinese as far back as the time of the Emperor Yü, about 2220 B.C.; and beer was manufactured in Egypt in the time of Senwosret III (Sesostris) 1880 B.C. The ancient Egyptians were skilled in the production and manipulation of metals, and were acquainted with a number of alloys. They knew how to temper iron, and to work copper, tin, and lead. They manufactured glass, and could fashion it into utensils by blowing; they made enamels and artificial gems; they were familiar with madder and indigo, and were acquainted with the use of mordants, and were expert as dyers; they were skilful tanners and workers of leather, and employed a variety of natural products as pigments, and as agents for colouring glass; they had knowledge of the medicinal virtues of plants, and were able to extract their healing principles; they were also well acquainted with various organic substances, such as alcohol, or spirit of wine, acetic acid, camphor, naphtha, starch, etc.; and with many inorganic products, as sulphur, nitre, alum, lime, sodium carbonate, copperas, sal-ammoniac, etc. But whilst many of these technical processes and products were known to the Egyptians at least two thousand years before the Christian Era, there is no direct evidence to prove that they originated with them. Indeed, there is good reason to believe that a knowledge of at least certain of them was communicated to the Egyptians from still older communities. Modern historical research has shown that the Hindus and Chinese practised the chemical arts from the remotest periods of which we have record. Trade routes existed throughout Asia from immemorial times, and it is highly probable that manufactured chemical products, and ultimately a knowledge of their mode of production, travelled westward from the Far East through Persia and Arabia.

Speculation among the Ancients. It was comparatively late in the history of human thought that men began to speculate on the origin and nature of chemical phenomena. In the outset, chemical processes were wholly utilitarian and empirical in character. Gradually, as their economic value was more widely recognized, they came to be practised as trade secrets by artisans, with whose operations the philosophers of antiquity had little sympathy. The attitude of the priesthood was a further bar to progress. Inquiries into the origin of natural phenomena by the laity were forbidden as irreligious. Such knowledge as was gained was, as far as possible, jealously restricted by them to their own order as successors of the medicine-men of primeval races. According to Herodotus, chemical laboratories were not unfrequently attached to Egyptian temples, and the priests were proficient thaumaturgists in wonder-making operations. There is no evidence that they ever pursued chemistry in the spirit of science, and no theory or speculation concerning the nature of chemical change has come down to us from Egyptian sources. Nevertheless, it has been surmised that Thales of Miletus, one of the earliest of natural philosophers, who lived for some years in Egypt, and is said to have been instructed in science by the priests of Thebes and Memphis, may have been influenced by their teaching. But little is known concerning the chemical philosophy of the Ancients. For the

reasons already given, it, in common with every other branch of natural philosophy, tended to be purely speculative. The orderly accumulation of facts by systematic observation and purposely directed experiment, on which alone a sound and consistent philosophy can be based, although one of the precepts of Aristotle, was the practice of a much later age. The false teaching of many of those who called themselves peripatetics was opposed to the true methods of rational inquiry. It is, however, interesting to note that at least two fundamental conceptions of the oldest systems of speculative philosophy remain intimately woven into our own body of doctrine, viz., the assumption of atoms and of atomic motion, and of a primal element or principle common to all forms and varieties of matter. But these ideas persist to-day only because they are consistent with the teaching of observation, and because the observed phenomena find an explanation more or less adequate by means of them.

Natural Philosophers of Arabia. The progress of chemistry as an art and, ultimately, as a science, and the diffusion of chemical knowledge, are, as in the case of all other branches of learning, largely affected by wars, the course of trade, dynastic changes, and the rise and fall of nations. A knowledge of Greek philosophy, and more particularly of the works of Aristotle, one of the profoundest and most luminous thinkers of old, had been communicated by Byzantine writers to Egypt, and became part of the learning of the Arabs when they made themselves masters of that country in the seventh century. They spread this knowledge with their conquests along the Mediterranean littoral, and with their occupation of Spain in the following century it passed over into Western Europe. During the greater part of the time the Moors held Spain, the rest of Europe was in a state verging on barbarism. The lamp of learning was only kept alight by the Moslem caliphats at such places as Grenada, Seville, Cordova, and Toledo; and it was entirely through Moslem teachers—Averroës, Geber, and Avicenna—that science was preserved from extinction, and that Christian scholiasts obtained an acquaintance with Greek philosophy and acquired their knowledge of the chemistry of the East.

Professional chemistry, as distinguished from technical or industrial chemistry, had its rise in the practice of physic. As chemical knowledge increased, there gradually arose a special class of operative chemists, more familiar with chemical phenomena in general, and more skilled in manipulative processes, and in the contrivance and use of chemical apparatus, than the artisans employed in technical routine. This special class, who ultimately came to be known as alchemists, were originally Arabian physicians, who had learned to recognize the therapeutic value of certain chemical products, and who themselves prepared the medicines employed in their practice. Among the most eminent of these were Abû-Moussah-Dschabir-al-Sufi, otherwise Geber, who is said to have been born in Mesopotamia in A.D. 702 and to have died in 765; the Persian Rhazes, or Abû Bakr Mohammed-ibn-Zakariyâ-el-Razi, who lived *circa* 925; and Abû Ali el-Hosein ibn-Abdallah ibn-Sina, or Avicenna, a native of Bokhara, born in 980, and one of the most distinguished of Moslem physicians. Their writings show that many of the processes of operative chemistry, such as distillation, sublimation,

calcination, filtration, etc., were well known to, and commonly practised by, the Arabians, and various forms of apparatus would appear to have originated with them. They were skilled in the preparation of certain saline substances and organic compounds, and knew of the common mineral acids and of their solvent properties.

Transmutation, the Elixir of Life, and the Philosopher's Stone. It is interesting to note that the oldest chemical writers make no mention of methods of transmutation, although they were doubtless familiar with the idea as part of current doctrine, and may even have believed in its possibility. It was at a later period that alchemy sought to realize the conception of the possibility of converting the baser metals into gold, and it was still later in its history that it enlarged its belief in the therapeutic efficiency of drugs so as to include the idea of the universal medicine and the elixir of life; no mention of these matters in alchemical literature is known before the thirteenth century. During the succeeding centuries, as far down, indeed, as the sixteenth century, the efforts of the alchemists were almost wholly directed to the realization of these beliefs. Indeed, it has been said that during the fourteenth, fifteenth, and sixteenth centuries the cult of alchemy attained to the dignity of a religion, and that belief in transmutation, and in the virtues and powers of the philosopher's stone, in the alkahest, and the elixir of life formed its articles of faith. According to Boerhaave, the earliest followers of these special branches of alchemy were Greeks—"most or all of them monks . . . who from their great laziness and solitary way of life were led into vain enthusiastical speculations to the great disservice and adulteration of the art." The greater number of the early western alchemists, among whom may be named Albert Groot, or Albertus Magnus (1193-1282); Roger Bacon (1214-1285); Raymond Lully (1225-1315); Arnoldus Villanovanus, or Arnaud de Villeneuve (1240-1313); George Ripley (*ob.* 1490)—were also ecclesiastics.

The Contribution of Alchemists to Knowledge. Although alchemy ultimately fell into disrepute, largely in consequence of the gross impostures of its latter-day professors, it is not to be assumed that all alchemists were necessarily cheats and knaves. Many of them were undoubtedly earnest searchers after truth. The belief in an alkahest, or in the elixir of life, might be an idle and baseless phantasy, but the idea of transmutation had a rational basis and a certain plausible support from imperfectly understood phenomena. It has even been heard of in these later times. Alchemy (said Lord Bacon) was one of those sciences which like astrology and natural magic, sway the imagination more than the reason; and it was mainly owing to this circumstance, and to its appeals to the credulity, superstition, and greed of its dupes, that it continued to flourish so long, and that it should seek to perpetuate its existence by linking itself up with theosophy and mysticism. The frauds of the so-called adepts eventually became so notorious that several countries passed stringent laws against the "craft of multiplication" (as the art of transmutation was called in legal phraseology), with the result that great difficulty at times attended the pursuit of operative chemistry. Alchemy now tended to revert to its original and more legitimate sphere. It was once more recognized that its true function was not to make gold artificially, but to prepare medicines and, incidentally, other

substances directly useful to the arts. There now arose the school of the iatro-chemists, whose leader and chief exponent was Philippus Aureolus Theophrastus Bombastus von Hohenheim—commonly called Paracelsus (1493-1541), the son of a Swiss physician and astrologer, a man of great powers and extraordinary talent, but of violent impulses, wayward, and intemperate of language and habits, who headed a movement which was one feature of the intellectual development of the age. He not only released medicine from the thralldom of a healing system based only on tradition, but, incidentally, he emancipated chemistry from the bonds which limited its proper expansion. The movement was revolutionary and, like most revolutions, tended to run into excesses. Many of the immediate followers of Paracelsus, who strove to carry out his doctrines—men like Thurneysser, Severinus, and Duchesne—were simply violent anti-galenists, bold and unscrupulous practitioners, who maintained that the Cabala and the Apocalypse contained the sum and perfection of all human knowledge, and who embraced Pantheism in its grossest forms. The inevitable reaction set in. The school was gradually purged of its extravagant tenets, and its later members—among whom may be specially mentioned Andreas Libavius (*ob.* 1616), John Baptist van Helmont (1577-1644), Francis de la Boë Sylvius (1614-1672), Thomas Willis (1621-1675), Johann Rudolf Glauber (1604-1668)—were, by their labours in placing and advancing chemistry on rational lines, the immediate precursors of Robert Boyle (1626-1691), with whom the age of scientific chemistry may be said to begin. Although the history of alchemy is largely a record of misdirected zeal and fruitless endeavour, and much of its abundant literature a chronicle of chicanery and fraud,

"There is some soul of greatness in things
evil

Would men observingly distil it out."

As Lord Bacon wrote in *De Augmentis Scientiarum*: "Alchemy may be compared to the man who told his sons that he had left them gold, buried somewhere in his vineyard; while they, by digging, found no gold, but by turning up the mould about the roots of the vines procured a plentiful vintage. So the search and endeavours to make gold have brought many useful inventions to light."

T. E. T.

CHEMISTRY, THE INSTITUTE OF.—This was founded in 1877, and incorporated by Royal Charter in 1885. It was considered desirable that persons practising analytical and consulting chemistry should have both practical and scientific knowledge, in view of the increasing application of chemistry to legal investigations; to public health; to adulteration of food; and to agriculture, arts, and manufactures.

The Institute was established to ensure to the Government and other public bodies the assistance of trained persons competent to practise in analytical chemistry, and to undertake the duty of testing their qualifications and of granting certificates of competency as the result of examination. The elevation of the profession, and the promotion of efficiency among persons practising analytical chemistry, were to be secured by the observance of strict rules of membership, and by setting up a high standard of scientific and practical efficiency.

The charter granted to the society empowers it

to lay down rules respecting admission to membership, to grant certificates of competency to members, and to authorize the Fellows and Associates to use distinctive letters after their names to indicate their status.

The council have, therefore, made regulations for the admission of students, Associates, and Fellows.

Examinations and Diplomas. A candidate for a studentship must be 17 years of age, and must have passed a preliminary examination in subjects of general education approved by the council. The examination must include English language, elementary mathematics, a foreign language; and one other subject chosen from mathematics, history, geography, or science. University Senior, Local, and Matriculation provide suitable examinations for this purpose. The candidate must be working at an institution approved by the council, or under the direction of a Fellow of the Institute, in a laboratory approved by the council and with the object of qualifying for the practice of professional chemistry. All students must present themselves for examination within five years of their admission. Registered students are admitted, to lectures and to the library of the Institute.

In the training of a student, the council insists that courses of lectures or other instruction shall be given *in the daytime* by the appointed teachers in a university, college, or school approved by the council; and that the student gives his whole time to the subjects of instruction in a college, or, if he is the pupil of a Fellow, part of his time in an institution and part under the direction of the Fellow. Chemistry is regarded as the principal subject, and not more than one-fourth of the student's time should be given to other subjects; and in the Institute's examination, special attention is given by the examiners to the record books of practical work kept by the students during their training, and to the extent of their knowledge of chemistry.

THE ASSOCIATESHIP (A.I.C.). The examinations include the Preliminary (see above); the Intermediate, in general and practical chemistry; and the Final, in a branch of chemistry selected by the candidate. A candidate may obtain exemption from the Intermediate examination by producing evidence of having passed an approved Preliminary examination, and of having regularly attended systematic *day* courses, approved by the council, for three academic years in chemistry, physics, mathematics, and one optional scientific subject. A university degree in Science is accepted as an alternative to the Intermediate examination, providing that the required subjects were taken.

Candidates for the Final examination must have passed the Intermediate, or an equivalent examination accepted by the council.

THE FELLOWSHIP (F.I.C.). For admission to the Fellowship, an Associate must have been registered three years, and during that period must have been continuously engaged in the study and practice of chemistry in a manner satisfactory to the council.

The Institute also examines candidates for special certificates in separate branches of chemistry.

A register of Fellows and Associates who are seeking appointments is kept at the offices of the Institute, 30 Bloomsbury Square, London, W.C.1.

CHEMISTRY, THE TEACHING OF INORGANIC.—The teaching of inorganic chemistry

now occupies an important place in any system of general education. While the practical utility of chemistry has been universally recognized, its true value, as a means of education, has only very slowly been perceived.

The principal functions of a well-designed school course in chemistry may be stated, to use the words of a pamphlet issued by a Government Department, to be these—

1. The education of the power of observation, involving the exercise of judgment and the training of the senses.

2. The training of the reasoning powers.

3. The training of the executive powers. The experimental work performed by the pupils themselves involves the cultivation of manual dexterity, initiative, and self-reliance.

4. The imparting of some of the more important principles and facts of physical science.

With regard to secondary school work (as opposed to technical school work), the acquisition of a knowledge of the principles and facts of chemistry should be regarded as of little importance compared with the training of the powers of the pupils, and the successful development of these powers will depend largely on the method of teaching adopted. Obviously, a superficial knowledge of these facts could be obtained by means of reading and lectures, but the educational value of such a course would be small. The chief reason for the inclusion of chemistry and physics in a course of general education is that these subjects—in a far greater degree than any other subject—afford facilities for training pupils in the methods of acquiring information for themselves. Professor Armstrong remarks that the most careful mathematical and literary training leaves uncultivated one side of the human intellect—the faculty of observing and of reasoning from observation and experiment. Every experiment should be, as far as possible, of the nature of research. This Research—or Heuristic—method, which, used with discretion, has yielded results of the highest educational value—has been largely developed by the inspiring efforts of Professor Armstrong. A former Vice-President of the Board of Education (Sir John Gorst) once remarked that “the power of research—the art of acquiring information for oneself—on which the most advanced science depends, may, by a proper system, be cultivated by the youngest scholar of the most elementary school.”

Laboratory Procedure. Whenever possible, each pupil should work alone; if, as sometimes happens, owing to difficulties of organization or equipment, the pupils work in pairs, it is invariably found that, on account of differences in temperament, one of the pupils does most of the work, and, consequently, alone obtains the full benefit of the course. Care should be taken that each pupil, before beginning the experiment, has a clear idea of the nature of the problem to be investigated. As little help as possible should be given by the teacher; in case of difficulty, the pupils should seek help from one another before applying to the teacher. The pupils should be permitted to walk freely about the laboratory, observing and discussing the work performed by the others.

To the uninitiated, it might appear that the task of the teacher under such conditions would be a very easy one; in reality, it is most arduous. He must always be on the alert to observe when mistakes are made. It is not always well to correct these mistakes at once: let them be carried to

their logical conclusion, in order that the mistake may be discovered and rectified by the pupil himself. The results should be recorded, as soon as obtained, in ink, in a note-book—never on scraps of paper; there should be no “copying-up.”

Scope and Presentation of a Course. Quantitative work should be begun at an early stage. As Professor Welton pertinently remarks: “Every branch of knowledge is at first merely qualitative, or at best very roughly quantitative. . . . As the power of exact measurement is increased, science increases. . . . Indeed, as scientific thought is exact thought, physical science cannot strictly be said to exist except in quantitative form! It is important to insist on accuracy from the very beginning; it is surprising what a remarkable degree of accuracy young pupils can attain to; it is also surprising to observe how keen they are, when taught under a rational system, to obtain this accuracy. Slovenly or careless work in the conduct of an experiment is very seldom due to the pupil—it is almost invariably due to a bad system of teaching, or to the weakness of the teacher, or to defects of organization or equipment.”

The teacher has failed in his work if he does not create in the minds of his pupils a feeling of interest and a desire to know—or do—more. Interest is the driving force, and the only one—except in extremely rare cases—that the teacher need rely upon. Encourage the pupil to initiate his own experiments; let him carry them out in the way that seems best to him. In his *Psychology of Education*, Professor Welton observes: “Unless the boy conduct the enquiry, the whole process is worthless as a development of efficiency in thought. It is in this regard that so much ‘science teaching’ fails to be scientific teaching. . . . Laboratory work is only profitable when it is a definite and conscious seeking by each individual pupil of the answer to a problem which he has himself felt as such, though probably he would not have so felt it without his teacher’s suggestions.”

The subjects chosen for investigation at first should be such as naturally appeal to the young mind—there is an abundance of such subjects in chemistry. Theory should play quite a subordinate part; equations and formulae are here quite out of place. After the experimental work has been done, the class should come together and discuss the results. A good deal of oral work is here necessary, and much skill and patience demanded of the teacher before an acceptable expression of the results is obtained. Economy and precision of expression are not usually found in young children.

No sharp line of demarcation divides the junior from the senior course. The pupil now shows more initiative, more self-reliance, his will is stronger; the teacher’s work is more indirect than ever. “Break your child’s will, in order that it may not perish,” wrote John Wesley. “No,” says the wise parent or teacher; “strengthen your child’s will, but lead it in the right direction.” And so the teacher grants increased liberty to his pupils: he trains them to rely more upon their own efforts, and less on him; for the good teacher works in such a way as to render himself unnecessary. Too much restraint devitalizes the whole personality of the pupil. When difficulties occur, the solution may be found in text-books; physical constants, atomic weights, etc., must be sought for by the pupils themselves. While the course is still mainly experimental, more attention should be paid to

theory. Books should be freely used, and instruction given as to their proper use and function.

Historical Method. Although the historical method is not suitable for a school course, yet the pupils should be familiarized with the works and lives of the great chemists, and in certain cases should conduct their experiments in the way in which they were originally carried out. A study of the lives of the great men in science—men whose names are seldom or never heard in the history class, however important the influence of their work may have been in the progress of civilization—cannot fail to have a stimulating and elevating effect on the minds of the pupils.

Chemistry for Girls. A good deal of controversy still exists as to what should be included in a course of chemistry for girls. If it be accepted that the reasons for the inclusion of chemistry in a school course are as stated above and that the acquisition of a knowledge of the facts and principles of chemistry is only of minor importance, then the argument of those who advocate that the chemistry course for girls should be drawn up with a view to domestic work, falls to the ground. Professional training—and this includes training for domestic work for girls—should have little or no effect in determining the school curriculum; this is a matter for the technical school, or for special work after the ordinary school course is finished. There seems to be no good reason for differentiating in any way the courses for boys and girls.

No scheme of work is here suggested. The Board of Education has wisely granted the fullest freedom to teachers in drawing up their syllabuses, so that the teacher has full play for the exercise of the spirit of enquiry and investigation, the development of which in the minds of his pupils is the primary object of his labours. E. C. L.

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CHEMISTRY, THE TEACHING OF ORGANIC.

—The teaching of organic chemistry proceeds on the understanding that the students have already acquired a knowledge of inorganic chemistry and the principles of the science, as exemplified by the properties of the commoner elements and their compounds. Looking back to one’s own experience, the practical work was mainly confined to the study of the analytical properties of certain of the organic acids. In recent years, the practical work has broken away from this analytical ideal, and it is now customary so to arrange the course of instruction that the student may acquire a knowledge of, and proficiency in, certain fundamental operations, and be impressed by his own actual experience with the realities of some of the more important typical compounds and their synthetical relationships, and learn something of the meaning of the general reactions employed in their preparation and in the transformation of organic compounds. Incidentally, the worker is made to realize the importance of physical constants in defining and characterizing substances; and thus from his own experience he learns the influence of impurities on these constants and something of the difficulties surrounding the preparation and production of a pure substance.

The presentation of the subject of organic chemistry lends itself to orderly and systematic



Queen's University, Kingston, Canada
Old Arts Building, now Theological Hall



University of Toronto, from Parliament Buildings Photo by James & Son

treatment, and a coherent expression of the facts of the science is more readily attainable than is the case with inorganic chemistry. Moreover, the molecular-atomic theory, of necessity, acquires special import and prominence in the study of organic compounds, as this theory is essential to the explanation of the phenomena of isomerism, which has resulted in those additions and extensions of the theory of Avogadro and Dalton.

Scope and Method. To fix the constitution of a compound, there is required, in the first place, a knowledge of its ultimate composition; secondly, we need to fix its relative molecular weight. This knowledge is then embodied in a molecular formula, representing the kind of elements and the number of their atoms. The third process is a thorough examination of its reactions and transformations into simpler compounds. This process—the dissection, as it were, of the molecule—supplies the material facts which, in accordance with certain conventions, are interpreted in a reaction-formula. The validity of the conclusions embodied in such formulae are next put to a further test, in the attempt to build up the compound by the interaction of substances containing such fragments or radicals as its dissection appears to indicate as existing in the molecule. This successfully accomplished, we have attained a confirmation of our conception of the constitution of the compound, and are enabled to explain the difference observed between the properties of this compound and those of its isomerides. Such constitutional formulae are usually interpreted in terms of a further hypothesis, in which it is assumed that the atoms of the different elements differ from one another in their atom-linking power, some requiring only one atom, others two atoms of other elements, and so on, to satisfy their atom-fixing powers, or valencies. By the aid of this hypothesis, and assuming that the atoms are linked together in the production of molecules, we form a mental picture of the mode of linkage of the atoms in the molecule in question.

The phenomena of isomerism, so frequently met with amongst organic compounds, have necessitated a still further probing of the matter of the arrangement of the atoms in a molecule. This further probing has resulted in the adoption of an explanation of the properties of substances, based upon a consideration of the distribution of the atoms in space. Thus the molecule becomes a three dimensional particle, and the study of the arrangement of the atoms therein may be fittingly described as the study of the architecture of molecules.

Thus the student of organic chemistry is brought into contact with the foundations of our present-day conceptions of molecule and atom, and the study of this branch of the science is essential to an understanding of chemistry and of the philosophy of the science. Further, the student is led to appreciate something of the complexity of chemical action, the influence of mass and of various external conditions in determining the direction of chemical change. Prominence in the teaching of this subject is given to the influence of composition upon the physical and chemical properties of compounds.

Development and Practical Applications. The study of organic chemistry is, therefore, not only important and essential to the right appreciation of the philosophy of chemistry, but it affords many examples of the every-day and industrial applications of the science which impart a human interest

to its study. In illustration, may be cited the manufacture of alcohol and the phenomena of fermentation; the utilization of fats and oils; the manufacture of explosives; the products of the destructive distillation of coal, etc.; and the derivatives from benzene so obtained—those multifarious derivatives forming artificial and synthetic dyes and colours, and substances endowed with valuable medicinal qualities. Nor should we omit, in this connection, mention of the knowledge imparted in the teaching of organic chemistry of the properties and uses of the starches, sugars, and other important vegetable products; and of the insight which has been acquired in recent years into the nature of such complex animal products as albumen and protein substance by the investigation of the polypeptides by Professor Emil Fischer and his pupils.

For many years past, teaching and research in organic chemistry has been chiefly directed to the elucidation of the chemistry of the carbon compounds, more especially from the point of view of their derivation from, and relationship to, the hydrocarbons. But, latterly, the experience gained by the study of the chemistry of carbon compounds has been employed in the experimental investigation of those complex substances which, from their origin and mode of production, are truly described as "organic." Under the style of bio-chemistry, a special department of the science has been founded, in the elements of which the medical student now receives instruction—both theoretical and practical—so that he may the more readily follow the instruction in physiology, in the study of which branch of science organic chemistry plays so important a part.

Looking back over the past fifty years, the teaching of organic chemistry in this country has shown a very gradual development. That there has not been that activity so noticeable in Germany is in no small measure due to the fact that so little has been done to encourage the industrial application of organic chemistry. This aspect of affairs is responsible for the impression that the study of organic chemistry is not congenial to the English mind; but that this is not the case, and that other influences have been at work, is sufficiently evident, when an authority such as Professor von Baeyer of Munich, relating how he came, in 1857, to be a worker in Kekulé's private laboratory at Heidelberg, states that "the modern organic chemistry, which had its origin in France and England, was by Kekulé imported into Germany, just as in his time Liebig had brought to Germany the chemistry of Guy Lussac." P. P. B.

CHEMISTRY, VARIOUS METHODS OF TEACHING.—The methods to be followed in the teaching of chemistry vary with the objective of the teaching, and with the character and age of those for whom the instruction is provided. From this standpoint the subject may be advantageously considered under the following headings—

I. The teaching of chemistry as part of a general school curriculum.

II. The vocational teaching of chemistry at universities and technical colleges.

III. Post-graduate instruction and the teaching of applied chemistry.

I. The Teaching of Chemistry as Part of a General School Curriculum. The materials of an experimental science such as chemistry offer many educational opportunities which are of value as a mental

training and also as a means of bringing home to scholars the importance of the national services of science. The methods of instruction to be adopted in schools should be so devised as to combine both points of view. It is particularly important to recognize that it is not so much the chemistry of the laboratory but rather the wider aspects of the science in their relation to the phenomena and problems of Nature, and to industrial progress, that really appeal to and interest the scholars; and that chemistry taught from this standpoint serves to instil a proper appreciation of its value and utility. The instruction should accordingly comprise the teaching of the fundamental principles of the science treated in relation to concrete materials and problems with which the scholars are familiar. Practical work in the laboratory should form the chief means of instruction, attention being especially directed to training in observation, and to the careful recording and comparison of the results obtained. There are numerous books on elementary practical chemistry available for the selection of the material concerned and which, suitably aided by the individuality of the teacher, should provide a satisfactory curriculum. On these lines the scholars should obtain a fair knowledge of the methods employed in the study and investigation of chemical problems, and from this basis, instruction in the applications of the science can be developed. Of the many applications available for selection, it will always be advantageous for the teacher to select such as are of local importance and of which he may have some direct knowledge. The correlation of the teaching in chemistry to that in other science subjects should receive careful consideration, and the time allotted to the teaching should be sufficient to secure its recognition as an essential part of the school curriculum.

II. The Vocational Teaching of Chemistry at Universities and Technical Colleges. A full-time course of training for a chemist, whether he is to enter chemical industry or to take up analytical or consulting work, or teaching, should extend over a period of three (or preferably four) years, followed, whenever possible, by post-graduate instruction. The modern developments of chemistry, especially in relation to collateral sciences, render a prolonged course of study necessary for all those who look forward to occupying positions of responsibility and to advancing the science by research, either in pure chemistry or in its technical applications.

The chemistry curriculum for students training for a vocational career should include lecture courses and laboratory work in inorganic, organic, and physical chemistry, suitably graded for each year of study, together with some instruction in the properties of materials and in mechanical drawing. The two latter subjects are of especial importance for those who are training to enter chemical industry, as they form the basis for subsequent helpful co-operation with the engineering staff in the design of the plant employed in large-scale operations. The instruction given in the lectures should aim at being supplementary to text-book information. It should include the historical development of the subjects of study, and such references to the *personnel* of research and of industry, as to make the progress of the science and its applications real and living. To obtain the best results by means of lectures, much is gained if the students have some previous knowledge of the subject-matter dealt with. This is difficult to provide for, as students look to

their teachers as the initiators of their reading; but if they are encouraged to read in advance of each lecture, the value of their studies is much enhanced by the complementary and supplementary instruction of the lecturer. In the case of advanced students, seminar discussions form a valuable adjunct to the ordinary lecture courses. The laboratory work in each branch of the science is to be regarded as by far the most important part of the instruction, for it is in the laboratory, rather than in the lecture-room, that the real teaching of chemistry must be centred. The sequence of the subject-matter of practical work will vary with the individuality of the teacher, and it is well that it should not become stereotyped. It is, however, necessary to recognize the importance of analytical chemistry as the basis of laboratory work, both on account of its value as a training in the methods of experiment and as fundamental for all further work in every branch of the science. The analytical methods taught should be those that are in actual use, not obsolete methods such as are too often described in text-books on practical chemistry. Qualitative analysis is advantageously postponed to a later period in the curriculum than was formerly the case, so that it can be studied with a proper previous knowledge of the substances concerned. The methods of instruction in practical organic chemistry and in physical chemistry, as described in modern text-books, form a satisfactory basis for laboratory teaching. The chief considerations to be kept in mind are that each experiment carried out should be definite and complete; that comparative variations in the conditions of the experiments should be studied by means of typical examples; and that in the case of preparative work, both in organic and in inorganic chemistry, the economic factor as represented by yield and by-products should be duly considered.

III. Post-graduate Instruction and the Teaching of Applied Chemistry. The completion of a three or four years' course of study is to be regarded as only sufficient to bring a student to that stage at which he can begin to make use of the knowledge which he has obtained. A training in such use of knowledge is comprised in post-graduate instruction and in the teaching of applied chemistry. The latter must be founded on a sound previous training in the principles and practice of the science of chemistry. The method of post-graduate teaching of outstanding value is the training of students in the methods of research. The individual taste and ability of the student should be considered in the choice of the subject of investigation. The onus for the suggestion of a subject must in almost all cases rest with the teacher, for it is unlikely that any average student will, at this stage in his career, have a suitable and sufficiently definite subject to suggest for a first research; and it is unwise to allow time to be spent upon work of a character which is unlikely to lead to some definite results within a reasonable period. From the teaching standpoint, the great importance of research work is that the investigator has to stand by his results. The accuracy and reliability of his work is on trial, and the element of responsibility thus introduced into his labours is usually of far greater value than that of the discoveries made. In association with the teaching of the methods of research, instruction should be given in the use and critical analysis of chemical literature. Other post-graduate training may be concerned with the detailed study of special

branches of chemistry, especially borderland subjects connected with collateral sciences.

The methods of instruction in applied chemistry necessarily depend upon the industry concerned. The teaching of the technical details of specific industries is of doubtful value, unless given by experts to those who have already gained some technical experience. Such students have the requisite previous knowledge to appreciate and follow the instruction; when such teaching is possible either by means of evening or part-time day courses, the method is of much value. There are, however, some concomitants of all industrial processes which can form the subject-matter of ordinary post-graduate study. These include such subjects as fuel and power; the properties and methods of testing of materials of construction; and the technical applications of the principles of physical chemistry, for which satisfactory lecture and laboratory courses can be provided without attempting to introduce large-scale operations into the teaching curriculum. Training in the methods of research is also to be regarded as an essential portion of the instruction in applied chemistry.

C. A. K.

CHERWELL HALL (Oxford).—Was established in 1902, as a Training College for Secondary School Teachers. It is a handsome building, with extensive grounds on the banks of the Cherwell, and provides accommodation for fifty students. A new wing was added in 1906, and a second wing and a library in 1910. The students are mainly graduates of British and Colonial universities, and are prepared by a one-year course for the Oxford Education Diplomas and the Cambridge Teachers' Certificate. Associated with Cherwell Hall is a Secondary School for Girls, recognized by the Board of Education. Cherwell Hall and the secondary school are under the same Lady Principal.

CHESHIRE COUNTY TRAINING COLLEGE, CREWE.—This College, established in 1908, is a pioneer of the modern type of territorial training colleges.

Cheshire County Education Committee was one of the earliest authorities to adopt the system of bursars (in place of pupil-teachers), and to decide to organize its own college to train them. Work was begun, in 1908, in temporary quarters in Crewe. Meanwhile, land was purchased from the Marquis of Crewe, and the permanent buildings of the College were erected. The new College was formally opened by Mr. C. P. Trevelyan, M.P., in 1912. The buildings, with accommodation for seventy women and fifty men stand in excellent playing-fields and gardens, and comprise the main building, the women's hostel, dining halls for men and women, and Principal's house.

The course of study is the ordinary two-year course for the Board of Education Teacher's Certificate. An outstanding feature of the work has always been the very large amount of time spent by the students in actual teaching practice, which is in consequence of most of the students entering with no previous teaching experience. The needs of rural Cheshire have always been kept in view; and a complete course of school gardening and nature study is provided, while field excursions are held each year in Cheshire and amid the Welsh mountains. Courses in advanced handicraft (wood and metal) are also provided and the present

equipment for this purpose is being revised and extended.

One characteristic of the corporate life of the students is the amount of personal freedom allowed, with the consequent evolution of the best forms of self-government both in sport and study.

The Principal is Mr. Robert Delaney, B.A. The Warden of the Women's Hostel and Vice-Principal is Miss A. Sweaney, B.A. F. F. P.

CHESTER TRAINING COLLEGE.—The Chester Diocesan Board of Education was formed in 1839, and, with the support of the Earl of Derby, established a training college for Church teachers. Two schools—one elementary and one commercial—were built to afford practical training for the students. The first Principal was the Rev. Arthur Rigg, M.A., a pioneer of education in the North, who insisted on the value and the necessity of training children in thought, observation, and manual dexterity, for the future benefit of the work in the great manufacturing centres. From 1840 to 1842, the students, few in number, were accommodated in two houses and taught by the Principal, assisted by a vice-principal and a visiting music-master. On two half-days a week the Principal and the students took charge of the Diocesan School. A College was built, and the late Mr. W. E. Gladstone spoke at the opening ceremony in 1842. A practising school was opened in 1843, with industrial sections, a laboratory, and two steam engines. The teaching included carpentry, cabinet-making, brasswork, bookbinding, and a number of other branches of manual work. In 1844 the students were often engaged in quarrying the stone to be used for the College Chapel, which was completed in 1846.

About twenty Queen's scholars were first admitted in 1850, but numbers increased rapidly, and in recent years have been about 110. A College Model School was opened in 1901.

The staff consists of university tutors, some being distinguished old students.

CHESTERFIELD, LORD (1694-1773).—Was a Member of Parliament from 1716 until 1726, when he became Earl of Chesterfield. He supported Walpole until the latter introduced his Excise Bill; he then joined the Opposition, and subsequently held office under Pelham. Ill-health led him to retire from public life in 1748. As a writer, Chesterfield is best known for his *Letters* to his son, the purpose of which was to train his natural son Philip as a polished man of the world. Johnson remarked that these letters taught the morals of a harlot and the manners of a dancing-master. Boswell adds that, in some passages, they "encourage one of the vices most destructive to the good order and comfort of society which his Lordship represents as mere fashionable gallantry; and in others they inculcate the base practice of dissimulation and recommend a perpetual attention to external elegance of manners." They also contained, however, many good precepts of conduct and genuine information on life and manners. Johnson desired to dedicate his Dictionary to Lord Chesterfield, but received no encouragement from him. On the eve of its publication, Chesterfield wrote in its praise, and drew from Johnson an indignant letter rejecting his belated patronage.

CHETHAM LIBRARY.—(See LIBRARIES IN THE SEVENTEENTH CENTURY.)

CHICAGO UNIVERSITY.—This was incorporated in 1890. The promoters were the American Baptist Education Society, which for some thirty years previously had carried on a university in Chicago. Generous pecuniary assistance was given to the founders by Mr. John D. Rockefeller, and advice in organization by Dr. Harper, of Yale University. The trustees include a majority of members of the Baptist churches of America, but the charter prohibits the application of theological tests either to students or members of the teaching staff. The University was opened on 1st July, 1891, under the presidency of Dr. W. R. Harper, and was well provided with buildings, equipment, and revenue derived from landed property. In 1898, University College was opened to provide courses of training and instruction for teachers. At different times, theological, medical, and law schools were added; and, in 1901, the Chicago Institute, the Laboratory School of the University, and the Chicago Manual Training School were united to form a School of Education and to provide training for all classes of teachers. The schools and colleges of the University provide courses in literature, arts, science, divinity, education, law, medicine, and philosophy. A four-year course is prescribed, the juniors being known during two years as freshmen and sophomores, and becoming seniors in the third year. The University Extension Division provides lectures, study courses, and correspondence tuition. A University Press publishes and distributes books and magazines. Degrees are conferred on Bachelors of Arts, Science, Philosophy; Masters of the same faculties, and Doctors of Philosophy; on Bachelors of Divinity, and on Bachelors and Doctors of Law. In Medicine, the Bachelor's degree is conferred; but for the degree of M.D., a four-year course at Rush Medical College is required. (See also UNITED STATES, COLLEGES AND UNIVERSITIES OF THE.)

CHICHELE, HENRY (1362–1442).—Educated at Winchester School, and New College, Oxford, he became Bishop of St. David's in 1408, and Archbishop of Canterbury in 1414. As archbishop, he resisted the claim of the Pope to dispose of ecclesiastical preferments in England, and strove to prevent the spread of Lollardism. In his later years, he commenced and completed the erection of All Souls' College, Oxford; and endowed it under the name of "*Collegium omnium animarum fidelium defunct. de Oxon.*" The members of the College were to pray for the King and archbishop during their lives and after their death, for those who had fallen in the French wars, and for the souls of all who had died in the faith. By his high influence in the State, Chichele secured many privileges for both the universities; and education, such as he conceived it, always found in him a generous supporter. He also freely expended his wealth in promoting public and benevolent undertakings.

CHICKEN-POX.—(See AILMENTS AND INFECTIOUS DISEASES IN SCHOOL LIFE; INFECTION AND SCHOOL CHILDREN.)

CHIGWELL SCHOOL.—Samuel Harsnett, Archbishop of York, founded the schools at Chigwell in 1629; in 1871, the Endowed Schools Commission granted a new scheme: the English school became a public elementary school, while the grammar

school was improved and enlarged. It has now spacious and convenient premises, and a good equipment of laboratories and classrooms, two boarding-houses, a chapel, library, gymnasium, and swimming-bath; there is a cadet corps (O.T.C.). Ten entrance scholarships and one leaving scholarship are awarded. The boys number about one hundred, half of them being boarders. William Penn was educated there.

CHILDHOOD SOCIETY, THE (1897–1907).—This had for its aim the scientific study of the mental and physical conditions of children. It was formed to continue and extend the work of the committee appointed by the International Congress of Hygiene and Demography (London), which committee had investigated and reported on the mental and physical conditions of 100,000 children in various schools. Its objects were (1) to promote the study of educational methods, and of the environment best suited to ensure the mental and physical development of school children; (2) to continue scientific enquiry, etc., etc.

The President of the Committee, the late Earl Egerton of Tatton, became President of the Society; and the Chairman, Sir Douglas Galton, became Chairman of the Council. From the report on 100,000 children, a committee of the British Association, acting in conjunction with the Society, issued eight supplementary reports dealing with (a) dull and mentally defective children; (b) distribution of defects among nationalities and social classes (England); (c) exceptional children; (d) nerve signs, etc. Memorials were presented to the President of the Board of Education in 1901 and 1903, urging that (a) a scientific commission be appointed to determine the mental and physical condition of portions of the school population; (b) the Government should obtain information as to the social necessities of all defective children; (c) the Act of 1899, *Elementary Education (Defective and Epileptic Children) (g v.)*, be made compulsory; (d) provision should be made for the special training of teachers wishing to qualify for the care of defective children; and (e) enquiries should be made into the best means of dealing with defective children in after-life, and for determining the authority to be entrusted therewith.

Information arising from the Society's investigations was laid before Royal Commissions, Departmental Committees of the Education Department, the Home Office, and the Local Government Board; also the conclusions arrived at, viz., (a) about 1 per cent. of school children are either physically or mentally defective; (b) in many districts these children either do not attend school, or do not profit thereby, and have little chance of becoming useful citizens; (c) educational neglect of feeble-minded children is harmful to themselves and the State.

Members of the Society gave evidence before the Departmental Committee on Physical Deterioration, and a deputation was sent to the Prime Minister (Sir Henry Campbell-Bannerman) urging the establishment of an Anthropometric Survey.

Two courses of lectures were given annually, and visits made to institutions where children were scientifically studied. Representatives were appointed to attend conferences and international congresses; public meetings were arranged; "*Transactions*" issued; prizes for essays given; and a library was formed.

In 1904 the President suggested a consideration as to whether societies with kindred objects could

combine and gain in influence by co-operation, so a Joint Committee of the Society and of the British Child-Study Association [London branch] (*q.v.*) was appointed to arrange courses of lectures, etc., etc. This co-operation proved successful; and on 18th June, 1907, the Joint Councils met to carry into effect the amalgamation of the two societies under the title of the Child-Study Society, London.

W. J. D. M.

CHILDHOOD AND ALCOHOL.—(See ALCOHOL.)

CHILD NURSING.—(See NURSING [CHILD], THE TEACHING OF.)

CHILD PSYCHOLOGY, PHYSIOLOGICAL ASPECTS OF.—(See PHYSIOLOGICAL ASPECTS OF CHILD PSYCHOLOGY.)

CHILD-STUDY.—Child-study as a separate and important branch of education was first organized and developed under the direction of Dr. G. Stanley Hall, President of Clark University, U.S.A. In connection with the World's Fair, which was held at Chicago in 1893, an important Education Congress was held, and a number of British teacher-delegates attended. The section which dealt with child-study was presided over by Dr. Hall, and three of the British women-teachers here came under the inspiring influence of Dr. Hall, and of Professor Earl Barnes, who, later, materially helped the growth of the child-study movement in Britain. They returned home thoroughly imbued with the need for, and usefulness of, such study, and, with the help of influential educational and medical friends, they founded the "British Child-Study Association" in Edinburgh at the University Extension Summer Meeting of 1894. Branches were afterwards opened in Cheltenham and London. From the first, the medical profession has been keenly interested and influentially helpful; while teachers, parents, doctors, school managers, inspectors, and social workers form the bulk of the members. In 1898, through the efforts of the late Mr. H. Holman and Mrs. Langdon Down, the Association was placed on a sound constitutional basis, and the branches affiliated. The affairs of the Association are now managed through a Central Council, composed of delegates from each branch, or "Constituent Society." Thus unity of aim and centralization of results were secured, without interfering with the adaptation of diverse interests consequent upon the special environment of each separate branch. Branches were later formed at Derby, Newcastle, Manchester, Birmingham, Liverpool, Dundee, Halifax, Tunbridge Wells, and the Hartlepools. The Annual Conference of the Association, attended by the delegates from the constituent societies, is usually held in May, at the different centres in turn. The present title is "The Child-Study Society," and the headquarters are at 90 Buckingham Palace Road, London, S.W.1, where the lectures and discussions arranged by the London Society take place.

In 1905 the Child-Study Association began to work in co-operation with the Childhood Society (*q.v.*). As both societies had similar aims, and in many respects covered the same ground, it was felt a waste of energy and organization to continue two sets of lectures, when both societies would be strengthened by co-operation. Accordingly, a joint committee was appointed to draw up a

programme of arrangements. Through the efforts of a President of the London Society, an active and generous co-operation with the London University Extension Board was brought about, and a three-years' continuous course of lectures on "The Evolution of Mankind, as seen in the Child and the Race," was arranged and successfully carried out.

Aims. These were originally stated to be: "To interest parents, teachers, and others in the systematic observation of children and young people, with a view to gaining greater insight into child-nature, and securing more sympathetic and scientific methods of training the young."

In 1902 this was further expanded so as to read as follows: "The Association seeks to interest parents, teachers, and medical men in the study of children, in the belief that it is only by a more precise knowledge of the natural process of unfolding of the human mind, and of the way in which this can be modified by the environment, that further advance can be made in elucidation of the principles of a natural and sound education."

The different opportunities of these three classes of interested persons suggest different modes of approaching the problem, and all methods of exact and intelligent research are welcomed, provided they do not conflict with the well-being of the child. The studies hitherto made, besides throwing light on the mutual relations of bodily and mental growth, and the moral development of childhood and adolescence, serve to provide material for a science of genetic psychology, and are found to have an important bearing upon many social questions.

Dr. Hall has well summed up some of the benefits of child-study in the following extract: "It has brought together higher and lower grades of education, and tends to mark the unity of educational systems. It has distinctly helped to bring the teacher *en rapport* with individual pupils and has helped towards the discovery of nascent periods, when the individual subjects can be most effectively taught. It has brought together parents and schools in many interesting ways; it has increased the love of children, has lessened the number of misunderstood children, and has taught us to recognize the superior law of the nature and needs of childhood."

Methods. Various studies and special pieces of investigation have been undertaken by members of the Society and reported from time to time in the magazine *Child-Study*, and elsewhere. Others were taken up under the direction of Professor Barnes, and published fully in his *Studies in Education*. The chief work of the Society is the organization of courses of lectures by men and women who are authorities on child-study and general education. These lectures are usually followed by interesting and suggestive discussions. Further investigations of a given problem—by the aid of *questionnaires*—are undertaken and reported upon, and Circles are held for reading, study, and investigation. Studies are made of individual children, or of groups of children or young people, and the results given. Visits are organized to places of special interest in connection with the particular problem being studied; while occasional social gatherings give opportunity for members to become acquainted, and to exchange views and experiences. Pamphlets dealing with special phases of the work are, from time to time, published by the Society (*e.g.* "How to Conduct Study Circles"). Since 1899 the Society has published its own magazine, at first entitled *The Paidologist*,

but latterly *Child-Study*. The Society possesses a valuable library, which contains many books, papers, and magazine-literature dealing with child-study; it is free to members.

A useful bibliography of books and articles bearing upon child-study is published annually by Dr. L. N. Wilson, the Librarian of Clark Library, Worcester, Mass. K. STEVENS.

CHILD-STUDY ASSOCIATION, THE BRITISH. —(See CHILD-STUDY.)

CHILD WELFARE SOCIETY, THE EDUCATIONAL WORK OF A.—The object of the educational work of a child welfare society is to train a mother in "Mothercraft," in all its branches, in order that she, in turn, may educate her child. For the best results to be obtained, child welfare work should begin at the earliest possible stage of the existence of the child, that is, during the first of the nine months previous to birth. During this ante-natal period, a mother is taught how to keep herself in health, how to prepare for her baby, and how to tend it in its natal and post-natal existence. If the confidence of the mother can be secured at this period, the lessons taught may be of far-reaching benefit to herself and to her child. It is one of the most important periods at which to educate.

But it is chiefly after the birth of her child that a woman seeks help at a child welfare centre; and the great object is to teach her that "prevention is better than cure," and that it is easier to nurture a child successfully by obeying the laws of health and so preventing disease, than to cure disease which has occurred as the result of breaking those laws. The mother is also taught the importance of training the body as well as the mind of her child in proper habits.

The Need for Instruction. For national reasons it is imperative that the devastating inroads made by the Great War on the population should be repaired, and infant mortality be reduced to a minimum. Not only mortality, but infant morbidity should also be reduced. For humanitarian reasons, the need of the work, if it lead to the betterment of the health of the individual, is all-important, as what more cruel fate can overtake an adult than to find himself handicapped for life by some weakness or disease contracted in childhood and preventable in its early stages? The instincts of motherhood among the lower animals are wise ones, and their offspring grow and flourish without undue effort; but this is not the case with the highest class of animals (*i.e.* the human animal). No woman is a "born mother." Knowledge of mothercraft must be acquired, and only too often it is acquired at very high cost to the child. All human mothers need to obtain knowledge successfully to rear a child, the richer classes of the community as well as the poorer. Many of the former receive an expensive and elaborate education, and leave school or college with an insight into most subjects, except the important one of mothercraft. Should they marry and have children, the evil result of their ignorance is not so marked, as they can afford to pay fees to physicians and nurses qualified to give sound advice; but, even then, occasions of sudden, sharp illness may arise with no professional aid available, and the mother is forced to realize that her college education is useless in these crises.

It is certainly among the poorer classes of the community that the work is most needed. For instance, what knowledge of mothercraft has a girl who has worked in factory or workshop since early schooldays? She has not the advantages of her richer sister, and cannot at the birth of her child afford to call to her aid a physician or trained nurse, but must fend for herself after "the tenth day," when the midwife departs! Then she becomes, in many instances, the victim of the crass ignorance of her friends and neighbours!

Methods of Work. (a) **BY MEANS OF INFANT CONSULTATIONS.** The mother is here taught how best to feed her baby, special stress being put in the case of infants on the importance of breast-feeding, and the dangers attending the continued use of patent foods and stale foods; how to clothe it; and how to care for it hygienically. In these ways, proper habits of body as well as of mind are instilled.

(b) **BY LECTURES OR SIMPLE "TALKS" TO MOTHERS.** Mothers who come to a centre come to learn, and much useful knowledge may be instilled into their minds, resulting in benefit to their neighbours as well as to themselves.

(c) **IN THE HOMES.** The educational work of a child welfare society is usefully extended to the homes of members of the society. It is important to realize that a mother considers she has priority rights over her own child, and will not always brook what she considers official interference; but in most cases, if approached tactfully and sympathetically, she soon becomes willing to be visited, and to have explained to her more fully the advice given at the centre, and to be shown how much may be accomplished with the limited means at hand. There are times of illness, too, when it is impossible for a mother to bring her baby to a centre, but she is eager to learn how best to nurse him back to health; and then is the opportunity for a well-trained visitor to demonstrate how to put into practice the theoretical knowledge she has already received.

Cookery simply demonstrated in the home, making use of the utensils in everyday use, is more valuable than elaborate class teaching with every convenience to hand.

(d) **RESIDENCE IN AN OBSERVATION WARD** is important for educating the mother in carrying out certain methods of treatment which cannot successfully be done in the crowded home conditions.

Difficulties to be Overcome. The work of educating a mother in the successful rearing of a child is one that presents many difficulties. Among the difficulties to be overcome are—

(a) Popular errors, such as that the fat baby must be the best baby, and that the end and object of all feeding is to produce that fat baby regardless of proper development of bone and muscle; that the best preventive to cold-catching is to load the child with unnecessary clothing, and so on.

(b) The evil of securing present peace regardless of resultant trouble, by "dummy" sucking; irregular feeding; sleeping in same bed with parents; and, in short, anything to keep baby quiet for the moment!

(c) Superstitions and queer remedies, one of the most gruesome brought to light being that three live snails put in a bag and tied round the baby's neck gives a certain cure for whooping-cough!

(d) The "all-wise" mother, who considers she has nothing to learn because she has had many

children, regardless of the all-important fact that she has failed to rear them successfully!

(e) The young and easily-led mother, who is apt to be guided by the casual and conflicting advice of her neighbours and friends!

But all these difficulties may be overcome with patience; and when a mother or foster-mother realizes that all babies cannot be treated alike, that it is no easy matter to nurture a child, and that the Child Welfare Society specializes in the very knowledge which she lacks, she gives the readiest response, and becomes a centre of influence for good in her own home and among her neighbours.

All workers of a Child Welfare Society need special qualifications of sympathy and tact; and voluntary workers, if properly trained, are a great asset at "centres," where love and sympathy must go hand-in-hand with knowledge to produce the best results for the permanent welfare of mother and child.

M. A. L.

CHILDREN ACT, 1908, THE.—(See LAWS AFFECTING CHILDREN.)

CHILDREN ACTORS.—(See DRAMA IN THE TUDOR COURT AND CHAPEL, ORIGINS OF MODERN ENGLISH.)

CHILDREN, DANGEROUS PERFORMANCES ACT, 1897.—(See LAWS AFFECTING CHILDREN.)

CHILDREN (EMPLOYMENT ABROAD) ACT, 1913.—(See LAWS AFFECTING CHILDREN.)

CHILDREN, HEALTH OF.—(See CLINICS, SCHOOL.)

CHILDREN OF THE CHAPEL ROYAL.—(See DRAMA IN THE TUDOR COURT AND CHAPEL, ORIGINS OF MODERN ENGLISH.)

CHILDREN'S BOOKS. THE DEVELOPMENT OF.—Children's books, in a sense, have, in England, been coeval with literature. But they came into authentic existence in 1744. Before that date, six types of books (excluding schoolbooks) were used by children—

(i) Semi-educational books—instruction carefully but lightly veiled. These began with the dialogues and riddles of Aelfric and Alcuin; reappeared as imitations of Erasmus's *Colloquies* after the Renaissance; and persisted in such forms as Pinnock's *Catechisms*, Mangnall's *Questions*, Mrs. Markham's *History*, and *The Child's Guide to Knowledge*.

(ii) Works meant for adults, but offered also to children, or annexed by them. The earliest examples are *Aesop's Fables*, *Gesta Romanorum*, and such books as *Bestiaries*. The obvious modern instances are *Robinson Crusoe*, *Gulliver's Travels*, and *Midshipman Easy*.

(iii) "Books of Courtesy"—e.g. the works collected by the Early English Text Society under the titles of *The Babe's Boke* and *Queene Elizabeth's Academy*. These were guides to social behaviour, meant rather for the young person, like Chaucer's squire, than for children. In the seventeenth and eighteenth centuries they recurred in other and simpler forms.

(iv) A mass of oral tradition which, later in the seventeenth century, crept into print in chapbooks. These often unpleasing editions saved much folklore and nursery rhyme. They also helped to popularize imports like Perrault's *Contes de ma*

Mère l'Oie, and *The Arabian Nights*, and to carry on mutilated versions of mediaeval romances.

(v) "Good Godly books," a product of militant puritanism, full of hell, death, virtue, torture, original sin, and highly original methods of expiating it. There were occasional rhymes and stories in these works (the chief writers of which were James Janeway and Thomas White) which point to an under-current of less menacing morality.

(vi) Two books really meant to give children pleasure as well as to make them good—Bunyan's *Divine Emblems* (1686) and Isaac Watts's *Divine and Moral Songs*.

All this material was formless and unorganized. In 1744, John Newbery, Goldsmith's friend and employer, set up as a publisher of children's books. In 1744, also, one Cooper published the first and best collection of nursery rhymes—*Tommy Thumb's Pretty Song Book*.

The Period of Newbery and Edgeworth. This definite commencement of a policy, so to speak, standardized children's books, and gave them a uniformity which they have never really lost. They fall thereafter into periods, the spirit of which varied as the spirit of successive ages; but the industry of producing books specially for children remained constant.

Newbery's own period, from 1744 to about 1775, was an age of competent mediocrity. The books then issued were good; they were well produced, not at all badly written, not too moral, not too coarse (the chapbook existing, but under suspicion, *was* coarse), not too original, not too dull. The Moral Tale epoch, which lasted from 1775 to 1825 (from 1807 in a modified state), was apt to be dull, but it wrote admirable English, and much of the typography and illustration was good; bindings deteriorated slightly. In this age are great names: Maria Edgeworth (most perfect of story-tellers), Mrs. Sherwood (didactic, but a wonderful narrator), Anne and Jane Taylor ("Twinkle, twinkle, little star" was not their only nor their best effort), the Lambs, Mrs. Trimmer (who conducted a vendetta against fairy tales, but wrote *The Robins*), Day, Dr. Aikin, and Mrs. Barbauld. They were the moral and literary heirs, in a lower degree, of Johnson; they either feared Jacobinism so much, or believed in progress through education so strongly, that the youthful mind was their constant anxiety. Much of their work, therefore, was either directed against, or based upon, French models like Mme. de Genlis, Mme. le Beaumont, and Berquin.

Developments in the Nineteenth Century. In 1807 came the first signs of reaction—Roscoe's *Butterfly's Ball* and Mrs. Dorset's *Peacock at Home*, of which 40,000 copies were sold in a year. Thereafter there was a great output of books with cheerful coloured plates, lively rhymes, and a general air of levity. Dame Trot, Mother Hubbard, Dame Wiggins of Lee led this revel; while chapbooks, expiring almost of over-production, spread far and wide the fame of Thumb, Hickathrift, Jack, Guy, and Bevis.

A fourth period began in 1824, when "Grimm" was translated, with Cruikshank's illustrations. In this period mere levity was replaced by romantic pleasure and a determined effort towards beauty. "Felix Summerly" (Sir Henry Cole), at the beginning of the German-English epoch of thought, set fairy tales on a sound and sober footing with his *Home Treasury* (1843–1855). Mary Howitt translated Hans Andersen (1846). Side by side with this

serious treatment of Titania's court was the even more serious joviality of such writers as the various "Peter Parleys," the Howitts, and perhaps Miss Martineau (who, however, had the literary gift of the preceding generation). The didactic moralist also persisted to some extent.

It was not till the period generally named the "Sixties" that Nature and art fully coalesced, and the point of view of the writer became only an accident. The *Alice* stories of "Lewis Carroll" appeared in 1866 and 1872: George Macdonald, Kingsley, Ruskin, Mark Lemon, Mrs. Ewing, Lear, Hughes, Charlotte Yonge (purposeful, but a genius), Rands (the author of *Lilliput Levee*) were a band of writers strong enough to make their type of child's books the only possible one. They did not depend necessarily upon the hopes or fears of the time (in Miss Yonge's case the touch of just that dependence is a weakness). They wrote as it were *sub specie aeternitatis*.

Their art, however, was well on the way to become a craft; and that is what happened in the next (and overlapping) epoch—the period which produced G. A. Henty, W. H. G. Kingston, Ballantyne, Percy St. John. The labourer was worthy of his hire. Their books were excellent articles; good lively footnotes to the history of England which Green and Froude had begun to bring to the notice of the English people. But it may be suspected that they met a temporary need in a temporary way. Grown men cannot recur to Henty and Kingston as they recur to one of the men of genius who inspired the artists of that time—Stevenson.

Girls also were provided for in this period, but less copiously, the assumption being that boys will not read girls' books, while girls will and do read boys' books. The male type is, therefore, dominant.

Present-day Tendencies. The present day, so far as a contemporary can judge, has three main tendencies. It has acquired, in its lower sections, a liking for American imports of an unrestrained and superficial type. The Press has contributed to this facile interchange, not of ideals, but of opinions so light and ill-adjusted as to be hardly even ideas. A good deal of ugliness goes with the American comic standard in these matters. Secondly, there is the opposite tendency of an extreme worldliness—a hyper-sensitive civilizedness. Mr. Edward Cooper's *Twentieth Century Child* is a valuable study of this phenomenon. It involves a considerable artistic development, but its fastidiousness tends to weakness and irritability. Finally, the efficiency of the time is reflected in the surprising skill, the wide and often detailed knowledge, the care and yet the vigour of the customary or "Christmas" book for boys and girls; experts of all kinds write with real knowledge about every wonder of science, Nature, and art. Theirs is the Peter Parley outlook immeasurably widened, and not yet inspired by a philosophy of its knowledge.

In this brief survey, only a few names and dates have been mentioned; nor has criticism in any detail been attempted. Criticism of a children's book is at once a test of the book and a confession of the critic's incompetence. The book may be good and need not be criticized, or it may be bad and condemned; but unless a censor intervenes in extreme cases (as against "penny dreadfuls"), no criticism matters. A child judges its own taste best. Time, however, tells in an indirect way: the giver of books sees that a book is old-fashioned and does not buy it; so the child does not read it. It is hardly too

much to say that no children's book written before *Alice in Wonderland* is now assured of life: but it would be equally true to say that if some of the older writers had an equal chance they would compete equally with anything but *Alice*.

The landmarks of the past, however, are all that really stand out now. They are John Newbery, who first thought of children's books as a whole: Maria Edgeworth; Cruikshank's "Grimm"; *Alice*; and perhaps not a book at all—a play—*Peter Pan*; and a few visitants from another world—*The Pilgrim's Progress*, *Gulliver*, *Robinson Crusoe*, *Midshipman Easy*, *Treasure Island*. F. J. H. D.

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CHILDREN'S CARE COMMITTEES.—A children's care committee is a group of social workers attached to an elementary school, whose concern it is to see that every child in attendance is in fit condition "to benefit by instruction," and that no child leaves without such advice and guidance as to employment as may enable the best possible use to be made of the education received. Though there is nothing new in the idea of special provision for the needs of children, the care committee movement is a modern one, and the work of these committees centres in recent social legislation. Care committees were first brought into existence in 1907 by the London County Council as education authority for London, in order to administer the Education (Provision of Meals) Act, 1906. They were modelled on the relief sub-committees which, under the London School Board, the school managers had power to establish in poor schools. Of the very few such committees in existence, that for Tower Street, Seven Dials, was perhaps the most notable, where Miss Margaret Frere had developed a complete system for bringing to bear on each family sending children to school in an unsatisfactory condition the kind of help most likely to remedy the particular evil.

The functions and duties of the London School Care Committees were rapidly developed and expanded, and within two years had been made to include the administration of the Education (Administrative Provisions) Act, 1907, "medical inspection and treatment"; the Children Act, 1908, "neglect"; the Labour Exchanges Act, 1909, and the Choice of Employment Act, 1910, "employment."

Organization in London and Elsewhere. Children's care committees have been formed in various parts of the country, and differ widely in the work they undertake. The system has been, perhaps, most fully developed in London, where every elementary school or, in some few instances, group of schools, has its school care committee. The school managers appoint two or three of their number to serve on the committee, and to this nucleus the Council, through the Children's Care (Central) Sub-Committee of the Education Committee, add some four or six (or, in very large schools, more) social workers, experienced, or desiring to gain experience, in dealing with the problems which must be solved if every

child is to be, as far as possible, perfect material for the teachers to work on. These problems may be summed up as follows: "I cannot teach the underfed child, the child in need of medical treatment and healthier home surroundings, the neglected or overworked child; and all my teaching is practically thrown away if, on leaving school, the child drifts into unsuitable employment, where development and further education are impossible." The State solution of these difficulties is given in the legislation enumerated above: (1) for the underfed child, school meals are provided (Education [Provision of Meals] Act) (*q.v.*); (2) for the ailing child, medical inspection and treatment (Education [Administrative Provisions] Act); (3) for the neglected child, the protection of the law (Children Act) [see LAWS AFFECTING CHILDREN]; (4) for the child leaving school for work, expert advice and guidance (Labour Exchanges and Choice of Employment Acts). But the care committee, confronted with the individual child and its needs, finds the problems far from simple and the legal solution curiously inoperative. Meals are provided, but the child continues to look wretched; the inspecting doctor orders glasses which will cure the headaches, but "his father don't hold with them," and nothing is done; expert advice as to skilled trades is listened to, but "Boy Wanted" settles the work taken. It is in the home that the root of the difficulty must first be sought by full and sympathetic inquiry into the causes which have brought this particular family to the particular state of which the child's need is the symptom. Only when this is known and the parents' attitude of mind fully understood, can the care committee worker begin to apply the appropriate remedy. Through this worker, if she knows her job, all the resources of public relief and private charity are made available to supply what is lacking, and to prevent the recurrence of the need. Very often it is found that the whole difficulty is a question of home management and of differing standards in matter of cleanliness and health. The care committee worker will have useful suggestions to make and advice to give, but she cannot hope that advice will be accepted on these intimate matters until a relationship of friendship has been established. The main work of a children's care committee lies in raising the standard of home care. The only effective energy for this work is the force that is liberated when friendship is formed.

T. M. M.

CHILDREN'S CLOTHING, THE HYGIENE OF.—

The temperature of the body being higher than that of the atmosphere, it is necessary to conserve the natural heat. This is especially important when passing from a hot room to a cold hall or street. Animal products such as wool and silk are bad conductors of heat, and so prevent its too rapid radiation from the body. They absorb moisture readily, but retain their powers of ventilation, and so allow the absorbed moisture and perspiration of the body to evaporate. Vegetable materials such as cotton, linen, jute, etc., are good conductors of heat, and allow the body to cool very quickly: consequently, they are dangerous. They are poor absorbers of moisture, and, on getting wet, become air-proof and cause the perspiration to condense on the body, and so produce a cold, clammy effect. In children and aged people, the heat-producing powers are feeble, and it is, therefore, important to prevent chills. Wool is emphatically the best material for this

purpose, after which come silk, cotton, and linen.

Protection. Clothing should protect the wearer from scratches, bruises, etc.: it should shelter alike from heat and cold. It should afford protection from disease, and hence it must be clean and free from infection. Contagious diseases have often been conveyed by clothes: therefore all clothing worn or handled by any sufferer from such should be thoroughly disinfected. Poisonous chemicals are sometimes used for the dyeing and weighting of cloth, and these have caused skin diseases and sometimes death. Cotton goods, and especially flannel-ettes, are very inflammable, and should only be used after treatment with some such substance as tungstate of soda, which renders them non-inflammable. Cotton-wool has been the cause of so many awful tragedies, that it should never be used for clothing. Wool is the least inflammable; next comes silk; whilst linen and cotton are at the other end of the scale. Closely-woven materials do not burn so readily as loosely-made fabrics—contrast fustian with muslin. Clothing should afford protection by allowing room for the body to discharge all its functions freely. Tight bands, such as collars, waist-belts, garters, etc., retard the circulation, hinder digestion, etc., and so cause many diseases. Roomy clothing also allows free use of the limbs and facilitates bodily exercise.

Ornamentation. There is no reason why hygienic garments should not also be attractive. They need not be old-fashioned to be hygienic. Contrast in material; combination of colour; the use of buttons, braid, etc., for decoration are all useful; whilst the selection of suitable styles will also help. Silk is delightful to wear, and may be used for linings and trimmings on otherwise woollen garments. Colours are not only attractive to the eye, but have their effect on the mind of the wearer. Reds and browns are stimulating; greens and olives impart calm and quiet; blues and purples range in the direction of peace and despondency; white is joyous; and yellow is the colour of glory. In clothing, the primary colours are glaring and crude—hence the tertiary shades are the best and neatest. Dark colours absorb heat, whereas light shades reflect it; so that colour plays a very important part in the hygiene of dress as well as in its decorative powers. It is of great service to adapt clothing to the different seasons.

W. D. F. V.

CHILDREN'S COURTS.—The subject of the Children's Courts is, to me, the originator and organizer of these courts in England and, subsequently, throughout Europe, one of absorbing interest, and the great success of the system is one of my greatest pleasures. Having, during a long life, taken great interest in the amelioration of the condition of children, it was with great enthusiasm that I took up the matter which was committed to my hands. It arose in this way. Late in 1904, the State Children's Association of London sent out a circular letter to Petty Sessional Divisions calling attention to the necessity for some improved method of dealing with erring children; and the study of and report on the matter were referred by the Birmingham Bench to a committee of magistrates, of which I was, and still am, chairman. Knowing that there was a system in America and Canada, I at once wrote to Judge Lindsey, of Denver, and many others, to obtain as much information as possible to enable me to draw up a scheme. I then

proceeded to elaborate my plan and submitted it to my committee, and it was approved with this one exception: that, whereas I thought it necessary to have paid probation officers as well as voluntary ones, the majority of my committee considered this unnecessary, and, to my regret, it was deleted. At the end of a few months, my idea was found to be correct, and paid probation officers were appointed. The plan was presented to the Birmingham Bench, unanimously approved, and ordered to be adopted; and I was asked: "How soon can you get to work?" By the great assistance of the Chief Constable, the justices' clerks, and others, I was able to say: "On this day week"; and so, on 13th April, 1905, the first Children's Court in Europe was opened, and has held sittings every Thursday since that date.

Procedure. The arrangements at Birmingham are as follows: The court is held at 10 o'clock, viz., one hour before ordinary police court work begins. The children and their parents or guardians enter by a different entrance from that used by the general public. On entering, they are placed in two separate waiting-rooms: those charged with minor offences in one and those against whom more serious charges are brought in another. No child hears the case brought against another, except in cases where two or more are brought up for an offence committed in company. The public are not admitted. The paid probation officers, the voluntary officers, and the representatives of various religious bodies are present, and those immediately connected with each case are only admitted during the hearing of the case in which they are concerned. The proceedings are as simple as possible; and no child is placed in the dock, and no child under sixteen can be sent to prison. There are eight magistrates, carefully selected for their knowledge of child-life, its troubles, and temptations; and a rota is arranged, so that two are present at each sitting of the Children's Court. Personally, I think this number should not be exceeded, as the whole business should be as simple as possible, for, if there is much formality, it has the effect of frightening some children so much, that an intelligible answer cannot be got from them; whilst others are rather proud of having so much attention paid them, perhaps for only having played "football in a street."

Children dealt with. Children may be classed as follows: Mischievous children; children who offend through temptation and ignorance; children who commit offences through environment and bad association; children who commit offences through parental neglect or from parents' incitement; children with criminal tendencies; children who are runaways or vagrants; children who are disorderly or ungovernable; and children who are badly treated by their parents.

There are many ways of dealing with the delinquent children, but it is not necessary to enter into these details in this article. I wish, however, to say that a great deal more good may be done by a kindly word of appeal to their better nature than by severe punishment: the rod often hardens a child, while a fine is simply a tax on the parent. But these kindly words must be regularly followed up by the probation officer's weekly visits when the child is placed on probation, and the period of this should seldom be less than twelve months. In certain cases, it is advisable to send children to industrial or reformatory schools, for there they

are taught discipline and also learn trades, which enable them to obtain situations on discharge. Of these institutions I cannot speak too highly, and from personal knowledge I can say that the men and women who manage them cannot be too warmly praised.

Probation Officers. The probation officers should be carefully instructed as to their procedure, and should ingratiate themselves into the friendship and confidence of the parents or guardians, as well as of the children themselves, so that they may be received into the houses they visit as "friends," anxious only to assist in improving the conduct and condition of all concerned. They should endeavour to obtain situations for those children old enough to work, but should in no way interfere with the religious opinions of the household, only inculcating the moral laws; and by explaining by-laws, etc., do all in their power to teach children how to avoid getting into trouble; and, above all, to teach parents their duty to the children with which God has blessed them. We have, in Birmingham, an excellent staff of five children's probation officers; and the success of their efforts and the great value of children's courts is amply proved by the fact that, having dealt with some fifteen thousand children since the opening of the court, only 5 per cent. of recidivists have been reported. The great diminution of the prison population may, I think, be attributed, in a measure, to the establishment of children's courts, for their work is to check crime at the spring and so prevent its reaching the flood. I am glad to say, as a result of correspondence, conferences, and personal visits in England and abroad, I have succeeded in getting children's courts established all over Europe, in Cairo and elsewhere. J. C. L.

CHILDREN'S DINNERS.—Early in 1905 an Inter-Departmental Committee was appointed, consisting of inspectors, examiners, and medical officers representing the Board of Education and the Local Government Board, to consider what was being done in providing meals for school children, and to report whether such relief could be better organized without charge on the public funds. An Act passed in the same year gave Local Education Authorities power to provide meals, to receive voluntary contributions, and to make a charge to the children. An amendment in 1906 provided that application might be made to the Board of Education for permission to expend public funds up to the limit of a halfpenny rate in providing meals for necessitous children. The limit was removed in 1908, and in 1909 the duty of deciding whether children were underfed was imposed on the medical officer of health, on whose recommendation meals should be provided.

CHILDREN'S EMPLOYMENT ACTS.—Much has been done on the continent of Europe towards the conservation of child life and the reduction of the evils due to the early employment of children, particularly in dangerous trades. Even the more backward countries have legislated with this object in view. Each different country has had a different foundation for taking steps in this connection. In England, the idea has been entirely the welfare of the child and the general well-being of the community. In France, Germany, Spain, and indeed in all the continental countries where a large army has been an absolute necessity, the physique of the

male portion of the population has been the chief consideration. In the case of Spain, the Minister of War is the person responsible for the promulgation of regulations relating to the employment of children, and for the enforcement of laws in relation thereto. Some of the laws of Spain are quite equal to the English law governing the employment of children. So far back as 1878, provision was made for the protection of child life; but the chief law of Spain is that of 13th March, 1900. The laws of the Southern-Latin countries, although good, are generally difficult to enforce, and are open to many exceptions in ordinary times.

Children's Acts on the Continent. In Spain, children are required to attend school to the age of 10, and from 10 to 14 must attend at least two hours daily for primary and religious instruction. The employers of such children are responsible for the provision of schools for their work-children. One hour daily for primary education is also required for young workpeople under the age of 18.

Working in mines is restricted to persons over 16, and similar provisions are made as to employment where inflammable and insalubrious materials are used. Night work is forbidden entirely for children under the age of 14; and, in certain industries, children between 14 and 18 are prohibited from working between the hours of 7 p.m. and 5 a.m. In any case, no person under 18 may work for longer than four hours in the night without a period of rest extending to one and a half hours at least. We find, also, provisions against persons under 16 being engaged in acrobatic performances except under strict regulations.

Financial considerations in Italy have always prevented good reforms from being carried into effect. Private initiative has tried to make up for the inaction of the State, but this is entirely voluntary. In 1873, an Act was passed forbidding the employment of children in itinerant professions; and a provision is contained in it prohibiting the emigration of minors for the purpose of entering such professions. The English law on this point was not passed until 1913. In 1902, further legislation took place regulating the work of women and children. Children under 12 cannot be employed in any factory; and boys under 13 and women of any age are prohibited from working underground in mines, galleries, or quarries. Dangerous and unwholesome work is forbidden for boys under 15 and girls at any age; and it is necessary, in order that a child may be admitted to work of any kind, that a certificate of good health and fitness for the work in question shall be produced. Night work is forbidden for children under 15; and in no case can such children be allowed to work for more than eleven hours out of the twenty-four, and from one to two hours' rest must be given after any spell of work extending for six hours uninterruptedly.

With regard to the employment of children in Germany, the chief provisions of the law are to be found in the Trade Regulations, and in the law for the Protection of Children of 30th March, 1903. The school-leaving age is 14 years, but certain circumstances are laid down under which a child of 13 may be released from school. A child so released may not be employed in a factory for more than six hours a day, and children between 14 and 16 years of age are limited to a working period of ten hours per day. All employers must keep a register in which are to be entered full particulars of all persons employed under age.

Provision is made for cases of industries where persons under age should not be employed for moral or hygienic reasons.

Belgium made provision in the law of 13th Dec., 1889, for the regulation of the employment of children and women. Each child or woman so employed is to be supplied by the *administration communale* with a registration book containing details of the law, in French and Flemish and having a form in which particulars as to name, sex, place and date of birth, domicile, name and address of parent or guardian are entered. The law itself prohibits the employment of children under 12 in mines, quarries, dockyards, factories, or public or private establishments in which businesses classed as dangerous, unhealthy, or wanting in proper accommodation are carried on, or in businesses where steam boilers or motors are at work. Such children may not be employed on harbours or in transport work, and the above rules apply even although the business is carried on in a private establishment employing only members of the family. Children under 14 years of age must not—even exceptionally—be employed after 9 o'clock in the evening or before 5 in the morning. In mines, however, children over 14 may be authorized to work at night, and boys of at least 12 years of age may be authorized to commence work at 4 in the morning. Children, young adults under 16, and girls above 16 and under 21, may not be employed for more than twelve hours in twenty-four; and these should be divided by intervals of rest equal in all to one and a half hours. Boys above 14 and girls over 16 (but under 20) may be authorized to work after 9 in the evening and before 5 o'clock in the morning for certain kinds of work, and for all kinds of work in case of a stoppage of labour outside the power of man or under exceptional circumstances; but under no circumstances can such young persons be made to work after 9 in the evening or before 5 in the morning. Adequate penalties are provided.

Until quite recently, the boy in France was overworked, troubled by long hours and short holidays; but now the law has fixed eight hours as the legal working day. In factories, the position of the child is becoming stronger. Education in France is compulsory up to the age of 13, and we have laws parallel with those of the other Latin countries. The law of 7th December, 1874, relative to the protection of children employed in *les professions ambulantes*, was followed by the law of 2nd Nov., 1892; and finally completed by the law of the 13th March, 1900, governing the working of infants, young girls, and women in industrial establishments. These laws have been varied quite recently by others regulating the night work of children, much on the lines of those of Belgium and Italy.

International Arrangements. In November, 1919, a conference of the International Labour Organization of the League of Nations was held at Washington, and a further conference in July, 1920, followed at Genoa. As a result of the deliberations at these conferences certain conventions relating to the employment of women, young persons and children were adopted. The most important articles of these conventions were those adopting an almost universal standard for the definition of "a child" namely the age of 14 years and prohibiting children under such age being employed in any public or private industrial undertaking. Each country is its own judge

as to where the line between industry on the one hand and commerce or agriculture on the other is to be drawn, but broad distinctions are made, and under these child labour in mines, quarries, factories, electrical works, shipyards, railways, docks, constructional works and transport except by hand, is forbidden. The conventions also provide against night labour by women and young persons under 18 in industrial undertakings, with the proviso that in certain trades young persons over 16 may be employed during the night where the nature of the industrial process demands that it be carried on continuously. *Night* in this connection signifies eleven consecutive hours including the period between 10 p.m. and 5 a.m. The employment of children on ships except school or training ships is also within the conventions, and provision is made for the keeping of a register for all young persons under 16 employed on board ship.

Education Acts in England. The attitude of the law in England towards the employment of children has been in favour of restricting that employment only during recent years. The Factory Acts, in conjunction with various Education Acts and the Employment of Children Act, have produced remarkable changes in the outlook of children. Whilst the Education Act of 1870 provided that children should attend school, it made no provision against the employment of children during school hours. This difficulty has been removed by the Education Act of 1876, with various amendments. After providing that it is the duty of the parent of every child to cause it to receive efficient elementary instruction in reading, writing, and arithmetic, the Elementary Education Act, 1876, provides that a person shall not take into his employment any child who is not of the age of 10 years, or being of the age of 10 years has not obtained a certificate of proficiency in reading, writing, and arithmetic, or of previous due attendance at a certified efficient school, unless such child being of the age of 10 years or upwards is employed and is attending school in accordance with the provisions of the Factory Acts or of any by-law of the local authority made under Section 74 of the Elementary Education Act, 1870, or amendments thereto. The age limit of 10 years was extended by the Elementary Education Act, 1893, and further by the Elementary Education Act (1893) Amendment Act, 1899, to 12 years, and, finally, by the Education Act, 1918, to 14, under which age full-time attendance at school is now compulsory.

The Factory and Workshop Acts. Under the Factory and Workshop Acts, 1901-1911, as amended by the Education Act, 1918, no child shall be employed in a factory or workshop during the period of time in which its parents are liable to give it an elementary education (*i.e.* a child may not be so employed before the end of the school term in which he attains his fourteenth year). A contravention of the Factory Act in relation to the employment of children is visited by a fine not exceeding £3 or, if the offence was committed by night, £5 for each child employed. The parent of the child is also liable to a fine not exceeding 20s. for each offence, unless the court is satisfied that the offence was committed without the parent's consent, connivance, or default. The provision of the law with regard to employment of children extends so as to prohibit a parent from employing his child in labour exercised by way of trade; but,

where a father keeps his child at home for domestic purposes, such employment is not a contravention of the Education Acts in relation to labour, although it may be a contravention in relation to non-attendance.

The Employment of Children Act. General restrictions on employment are laid down in the Employment of Children Act, 1903, as amended by the Education Act, 1918, by which it is provided that a child under the age of 12 shall not be employed; and a child, as defined above, of the age of 12 or upwards shall not be employed on any Sunday for more than two hours, or on any day on which he is required to attend school before the close of school hours on that day, nor on any day before 6 o'clock in the morning or after 8 o'clock in the evening.

A local authority may make a by-law permitting children of 12 or upwards to be employed before school hours or by their parents, but no such employment shall exceed one hour; and if employed in the morning for one hour, the afternoon's employment shall be limited to the same period.

In relation to mines, special provision is made in the Coal Mines Act, 1911, where it is provided that no boy, girl, or woman shall be employed in a mine between the hours of 9 at night and 5 on the following morning, nor on Sunday, nor after 2 o'clock on Saturday afternoons; nor shall such a person be employed for more than fifty-four hours in any one week, nor more than ten hours in any one day. No child under the Education Act, 1918, or under the Employment of Women, Young Persons and Children Act, 1920, may be employed in any mine to which the Coal Mines Act, 1911, applies, nor to which the Metaliferous Mines Acts, 1872-1875, apply.

The Prevention of Cruelty to Children Act, 1904, as amended by the Education Act, 1918, restricts the employment of boys under the age of 14 and girls under the age of 16 between 8 p.m. and 6 a.m. in respect of children under 14, and 9 p.m. and 6 a.m. in respect of other children. Further, under the same provision, children over 12 may be employed for the purpose of singing, playing, or performing, that is, taking part in an entertainment or a series of entertainments under a licence granted by the local education authority for the purposes of Part III of the Education Act, 1902. The application for licence is subject to an appeal to the Board of Education.

By the Education Act, 1918, where the local education authority is satisfied that a child is employed to the prejudice of its health and educational progress, the authority may either prohibit such employment or make conditions with a view to protecting the child. Further, any person employing a child so as to prevent it from attending school in accordance with the Education Act or employing a child whose employment is prohibited, is deemed to have employed the child in contravention of the Employment of Children Act, 1903, and is liable to a penalty.

In order to give effect to the conventions adopted at the conferences of the International Labour Organization of the League of Nations in respect of child labour, the Employment of Women, Young Persons, and Children Act, 1920, was passed and so far as the employment of children is concerned came into force on 1st January, 1921.

Under this Act the employment of children under 14 in industry is prohibited. It does not

extend to children who have passed their fourteenth birthday but are deemed to be under the age of 14 for purposes of the 9th Section of the Education Act, 1918, until the end of the school term in which their fourteenth birthday occurs. As section 8 (1) of the Education Act, 1918, was not made operative at the 1st January, 1921, children under 14 lawfully employed full time in an industrial undertaking at the commencement of the Act may continue to be so employed.

Where young persons, that is, persons over 14 and under 18, are employed in an industrial undertaking, a register is to be kept showing names, dates of birth, dates of entry into and leaving the services of the employer, and this register is open for inspection. Penalties are inflicted under the Act in case of employment contravening the Act.

Provision is made in the Act for the introduction of the shift system for women and young persons over 16 in any factory or trade between 6 a.m. and 10 p.m. where the employers and employees are equally willing and a joint request is made to the Home Secretary. The sanction may be conditional and revocable and is good for five years unless previously revoked.

The Employment of Children Act, 1903, makes provision for the drawing up of by-laws by local authorities in relation to street trading, and special attention may be called to this, as the local authority has power in making such by-laws to apply itself particularly to the protection of girls and the desirability of preventing the employment of young girls under 16 in streets or public places. As in other countries, injurious occupations are also legislated for; and a child is not allowed to work in any business where it would be expected to lift, carry, or move anything so heavy as to be likely to cause it injury; nor may any occupation be carried on by a child if such occupation is likely to be injurious to life, limb, health, or education, regard being had to his or her physical condition at the time.

Special provisions are also laid down in the Children Act, 1908, as to employment. These provisions generally relate to itinerant professions: singing, playing, and performing on licensed premises and the like; and of a similar nature are the enactments to be found in the Dangerous Performances Act, 1879 and 1897. The general effect of these Acts is to prohibit any person from causing a child under 14 or a young person—if a male under 16, if a female under 18—to take part in a public exhibition or performance whereby, in the opinion of a court of summary jurisdiction, the life or limbs of such child or young person shall be endangered. The parent or guardian or any person having the custody of such child is also subject to penalties if he aids or abets such person. The penalty inflicted upon either the person causing the child to perform or the parent or guardian of the child is fixed at a maximum of £10.

Of a different nature are the very wide powers given to local education authorities, under the Education (Choice of Employment) Act, to take such steps as seem to them desirable, after consulting with the Board of Education, to make arrangements for giving to boys and girls under 18 years of age assistance with respect to the choice of suitable employments, by means of the collection and communication of information, and the furnishing of advice. This power has already been

taken advantage of, and is being exercised in most of our large cities in conjunction with labour exchanges and bureaux. R. W. H.

Reference—

HOLLAND, R. W. *The Law Relating to the Child.*

CHILDREN'S HAPPY EVENINGS ASSOCIATION, THE.—(See PLAY CENTRES.)

CHILDREN'S READING-ROOMS.—(See LIBRARIES AND CHILDREN, PUBLIC.)

CHILE, THE EDUCATIONAL SYSTEM OF.—

Education in Chile is controlled by the Education Department, assisted by the Board of Secondary and University Education, the Board of Commercial Education, and the Superintendent of Elementary and Normal Schools. The Department of Labour, Industry, and Public Works controls the trade schools and colleges; the mechanical, mining, and agricultural schools; and the Agricultural Institute; trade schools for women come under the same authority. The right to teach is secured to private individuals by the Constitution. The State does not interfere in the matter of the methods adopted, but requires the hygienic maintenance of, and sanitary conditions in, school buildings.

Elementary education, established in 1810, at the time of the War of Independence with Spain, was modernized during the administration of President Santa Maria (1881-86), who arranged with Germany to send several Normal school teachers to reform the Normal schools already at work in the country. For a time, almost the whole of the teaching staffs in training colleges were Germans. In 1896, the Swedish system of *slöjd* (manual training in wood), embroidery, and sewing was introduced as part of the curriculum. The old German methods of physical education were also abandoned at that time, and the Ling or Swedish system was adopted.

For the last ten years we have regarded the systems of the United States as more fit for a republican and democratic country such as ours.

It must not be forgotten that Chile founded, in 1841, the second Normal school in the whole American continent, the first being that founded by Horace Mann at Boston.

The public schools are under the direction either of the Government or of the municipalities, though actually the latter have very few schools. They comprise elementary schools, with two grades of two years each; and high schools, which correspond to English grammar schools, with one grade (*i.e.* two years) more.

The curriculum is shown on the following page.

Besides numerous short summer courses established so that teachers may keep in touch with recent developments, there are fourteen Normal schools, four for men and the remainder for women. They are boarding or half-boarding schools. Half-boarding means that students are supplied with luncheon and tea.

Elementary and Normal schools, as well as secondary and high schools, are free. Instruction in the university is also gratuitous. The Government even supplies text-books to the elementary school children.

There are many evening schools for working-men.

In 1914 there were 3,087 national schools, with 6,347 teachers and 190,400 children, 100,575 of

SUBJECTS.	NUMBER OF HOURS PER WEEK.					
	First Grade.		Second Grade.		Third Grade.	
	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	6th yr.
<i>Spanish (Mother-tongue)—</i>						
Reading and Writing	9	—	—	—	—	—
Object Lessons	3	2	—	—	—	—
Reading and Recitation	—	6	—	—	—	—
Grammar	—	2	2	2	2	2
Composition	—	—	2	2	2	2
Dictation	—	2	2	2	2	2
<i>Mathematics—</i>						
Arithmetic	4	4	4	4	4	4
Geometry	—	—	1	1	1	1
<i>History and Geography—</i>						
History of Chile	2	2	2	1	1	1
Geography (of the World)	2	2	2	2	2	2
<i>Natural Sciences—</i>						
Natural History and Hygiene	—	—	2	2	2	2
Physics and Chemistry	—	—	—	—	2	2
<i>Morals—</i>						
Catholic Religion ¹	2	2	2	2	2	2
Civics	—	—	1	2	2	2
<i>Manual Training and Physical Culture—</i>						
Handwriting	—	2	2	2	2	2
Drawing	2	2	2	2	2	2
Physical Culture and Singing	4	2	2	2	1	1
Manual Training	2	2	2	2	4	4

¹ Not compulsory.

these being girls. In the same year there were 22,554 pupils in 490 private schools, taught by 1,412 teachers.

Co-education is carried on only in the first grade of elementary education; there is none in secondary schools, but there is a complete system in the university.

Secondary Education. In 1914 there were 42 secondary schools for boys and 44 for girls. They bear the name *Lyceum*, borrowed from the French, although French influence has been very slight. Among foreign institutions they most closely resemble the German *Realschulen* (*q.v.*). 12,158 boys and 7,952 girls were in attendance.

The curriculum is as below—

SUBJECTS.	Number of hours per week.		
	First 3 yrs.	Last 2 yrs.	
Spanish	4	4	3
French	3	3	3
English or German	3	3	3
Mathematics	4	4	3
Natural Sciences	2	2	2
Handwriting and Drawing	3	2	2
Catholic Religion ¹	2	1	1
Manual Training (wood carving, carpentry) ²	2	2	2
Physical Culture ³ and Singing	3	3	3
Physics and Chemistry	—	2	4
Civics	—	2	2
Philosophy	—	—	2

¹ Not compulsory. ² *Slöjd*. ³ The Swedish system.

In girls' lyceums, sewing and dressmaking take the place of wood and iron work. All girls take Domestic Economy.

Secondary school teachers come from two of the leading institutes of learning in the country, viz., the Pedagogic Institute and the Institute of Physical Culture and Manual Training, each of them bearing some resemblance to a superior Normal school, without being exactly like any foreign institution.

The Pedagogic Institute belongs to the Faculty of Philosophy and Arts in the university. The degree of Bachelor of Arts or in Mathematics is needed to qualify for entrance. In a four years' course, students take Pedagogy; Psychology, with research in the Laboratory of Experimental Psychology; and the History of Education; with one or two of the following optional subjects: History and Geography, Spanish, English, and German; Romance languages; Physics and Chemistry; Biology; Mathematics.

There are two adjoining lyceums, for girls and boys respectively, where students witness demonstration lessons, and practise teaching during the last two years of the course.

This Institute was founded in 1891 with a complete faculty of German professors, a few of whom remain to-day; the others have been replaced by native Chileans, who have studied in the leading European and American universities. In consequence of the work of the Institute, Chilean educational systems have become well known all over Spanish America; and foreign students, coming even from Central America and Panama, notwithstanding the fact that they are nearer to the United States, have attended courses in Pedagogics. It can be stated as a fact that education in such distant countries as Panama and Costa Rica has been modernized through the University of Chile, whose students have been leaders in education in other

countries. No other institute in South America has gathered more foreign students than this.

The Institute of Physical Culture and Manual Training has followed the Swedish system closely; its Director (Señor J. Cabezas), was a student for four years at Stockholm, and is aided by Swedish teachers, and by Chileans who have studied abroad.

The University of Chile has also the following professional institutes: School of Medicine, seven years' course; School of Pharmacy, four years' course; School of Dentistry, three years' course; School of Law, five years' course; School of Engineering, six years' course; School of Architecture, four years' course. All of them require as a condition of entrance the university degree of Bachelor of Arts or Mathematics. The School of Midwifery and Infant Management, Nursing School, and also the Art School, with its two sections of pure Art and Art Applied to Industry, are attached to the university.

In 1914 there were 3,266 students in attendance at the university.

Private institutes contribute to the secondary education of the country 125 schools, which are attended by 14,824 pupils.

The Catholic University of Santiago, supported by the Church, has about 750 students; it is the only private institution for higher education in the whole of Spanish America.

Technical and Special Education. Under the direction and control of the Department of Labour, Industry, and Public Works, there are several institutions devoted to the promotion of technical education.

There are thirty technical schools for girls, with 3,227 pupils. The first two grades of elementary education must have been passed before admission, and the following subjects are taught: Pattern-drafting, millinery, dressmaking; white linen work, sewing, embroidery, and lace-making; corset-making; cooking; drawing and painting; applied art, book-keeping and typewriting. Domestic economy is in each case compulsory.

There were, in 1914, five schools of Agriculture, two schools of Mining, an Agricultural Institute, two Trade schools, a National Conservatory of Music, and a Deaf and Dumb Institute. There is a Naval Academy; a school for the training of pilots for the Mercantile Marine; a Naval Academy, in charge of specially engaged British naval officers, for the training of staff officers for the Chilean Navy; a Military School; a school for the training of non-commissioned officers; a Military Staff College; and other special schools for the Army.

Military service in the ranks for one year is compulsory for all Chilean citizens; there are good elementary schools in all the barracks for those who have not already received a good primary education.

M. V.

CHILE, UNIVERSITY OF.—(See CHILE, THE EDUCATIONAL SYSTEM OF.)

CHINA, THE EDUCATIONAL SYSTEM OF.—The history of Chinese education is a subject of absorbing interest to all students who wish to trace the intellectual evolution of a large section of the human family. Despite China's geographical isolation from the rest of the world, and notwithstanding the vicissitudes of internecine warfare, the educational history of China has been one of

continuous development. The earliest record of organized educational schools dates as far back as the reigns of Yao and Shun (2357–2205 B.C.), which epoch saw the development of political, social, and intellectual life of the Chinese people, resembling in many respects the Antonine period of the Roman Empire. During the next two dynasties (2205–1122 B.C.), the early foundations of the Civil Service examination system, with which the Chinese educational system was often identified, were laid. The *Book of History* records the creation of offices of public education before 2205 B.C., and the earliest schools were known as the *Shang Hsiang* and *Hsia Hsiang*, meaning Institutions for Higher and Lower Education respectively. For the next nine centuries, the progress made in government, science, education, and philosophy during the early part of the Chou dynasty ushered in an era of prosperity and culture, similar to the Periclean age of Greece. Then it was that popular, as well as higher, education became provided by the State. For the content of education of that early period might be mentioned reading, writing, dancing, rituals, music, poetry, mathematics, archery, charioteering, personal morality, and ethics. When China reached the zenith of her civilization at that time, the number of schools was estimated, in the absence of authentic statistics, at 100,000. Beginning with the eighth century before the Christian era, there intervened a long period of political unrest due to the breaking up of the then existing feudal system. The Dark Ages of Chinese History lasted until the Renaissance of the Han Dynasty (206 B.C.–A.D. 221), when China's Heptarchy was unified under the first emperor Ch'in Shih Huang, who, desiring to date China's civilization from his own reign, conducted a form of Spanish Inquisition by burning all the books of Confucius and putting some four hundred and sixty scholars to death. On account of the persecutions, the ancient system of popular education passed away. On the other hand, during these troublous times China produced her greatest philosophers and teachers, chief among whom might be mentioned Laotse, Confucius, and Mencius. Hitherto, memory, the bamboo tablet, and the stylus were the only means of transmitting knowledge; but, during the reign of this autocrat, strips of cloth or silk were introduced as writing materials to facilitate the propagation of knowledge. The next two steps in the art of bookmaking, namely, the discovery of writing on paper with brushes of hair, and block printing, were not made until the second and ninth century A.D. respectively. During the subsequent dynasties, there was a revival of learning, with the revocation (A.D. 191) of Ch'in Shih Huang's edict that prohibited the study of Confucian classics. The new invention of writing with brushes on paper manufactured from the inner bark of trees contributed immensely to the reproduction of Confucian texts. Under the leadership of Tung Chung Shu, Ma Yung, Cheng Hsuan, and other educators of the time, the educational institutions were reorganized and a form of monitory system inaugurated. Consequently, the T'ang Dynasty (A.D. 620–907) became associated in the minds of the Chinese people with romance, wealth, and culture. It was then that Japan, Korea, and other neighbouring States sent students to China for an education. Toward the end of 740, the study of philosophy was encouraged, and the celebrated Imperial Academy known as the Hanlin

Yuan was established. The Sung Dynasty (960–1280) was also marked with great intellectual activity, when Feng Tao (881–954) introduced the art of block printing. Sciences in the form of mathematics, medicine, painting, and calligraphy were introduced into the curricula of the schools, and the youths of the age contended with one another to pass the competitive examinations which were much in vogue for the purpose of selecting officers for the State. Chu Hsi, the great commentator, revised the standard History of China (*T'ung Chien Kang Mu*); and Wang An Shih, the great reformer and economist, for the first time introduced practical subjects into the state examinations. Wang Yang Ming of the Ming Dynasty (A.D. 1386–1644) advocated the philosophical principles of pragmatism, and conceived education to be the harmonious development of the innate powers of the child. The Manchurian or Ching Dynasty, which terminated with the Revolution of 1911, gave China two great learned Emperors in K'ang Hsi and his grandson, Chien Lung. They were great patrons of letters, and under their supervision many valuable and voluminous compilations were made: notably, (1) the *K'ang Hsi Standard Dictionary of the Chinese Language*; (2) two literary concordances known as *P'ei Wen Yun Fu* of forty-four volumes, and *P'ei Tzu Lei P'ien* of thirty-six volumes; (3) two encyclopaedias, known as the *Yuan Chien Lei Han* of forty-four volumes, and *T'u Shu Chi Ch'eng* of 1,628 illustrated volumes; (4) the *Revised Edition of the Thirteen Confucian Classics*; and (5) the *Edition of the Twenty-four Dynastic Histories*.

Beginning of the Modern Era. With this rapid and general survey of China's educational growth for 4,200 years, we have closed that long history of isolated development, as with the year 1842 foreign intercourse began by the opening of five Chinese ports to commerce. However, the next sixty-three years was the period of transition, and the conservative forces of China waged a continuous but losing battle against the inroads of Western civilization and modern education. At first, only spasmodic attempts were made to establish modern schools—such as the *T'ung Wen Kuan* for training official interpreters in languages, sciences, and international law; the Naval Colleges of Foochow; the Mechanical School at the Kiangnan Arsenal; the Telegraph College of Tientsin; the Imperial Naval College at Nanking; the Mining and Engineering College at Wuchang; the Peiyang University of Tientsin; and the Nanyang College of Shanghai.

In 1872, through the influence of Dr. Yung Wing, the first Chinese graduate of an American College (Yale), the Chinese Government established a short-lived Educational Commission at Hartford, Connecticut, with about a hundred young Chinese students under their supervision.

In 1876, some forty-six students were sent to Europe by the Foochow Arsenal to study ship-building and navigation. All these expedients at educational reformation were only meant as a supplementary education, and there was no desire to disturb the existing systems.

It was not until after the China-Japan War (1894–1895), when the country was rudely awakened by the disastrous event, that Viceroy Chang Chih Tung wrote his famous book *Ch'uan Hsueh P'ien*, or *An Exhortation to Learning* (translated into

English by Samuel I. Woodbridge as *China's Only Hope*). This book shook the foundations of the Chinese educational world and exerted an enormous influence in preparing the minds of the Chinese people for educational reform. The bitter lessons of the China-Japan War and the Boxer Uprising, together with the object lesson of the Russo-Japanese War, helped to abolish the "eight-legged" essays of old, to induce a large exodus of students to go to Japan, and to recognize the students of modern schools and the returned students from abroad.

In 1903, a Special Commission, consisting of Sun Chia Nan, Chang Pai Hsi, and Chang Chih Tung, was appointed to draft a detailed system for national public education. The exhaustive report consisted of four printed volumes, and it was sanctioned by the Government to become the authorized system of educational organization. This First Modern Educational System can best be illustrated by a chart, and we refrain from making any comments in consideration of a later plan known as the New School System of 1912. (See page 321).

The systematic organization of China's Modern Educational System really began with the year 1905, when the system outlined by the Special Commission in 1903 was carried out. In order to propagate this comprehensive plan, the important measures adopted were as follows—

1. The creation of the Ministry of Education in 1905 to be charged with the duty of superintending and controlling the new Educational System.

2. The outlining of Modern Educational aims in 1906, namely, loyalty to the emperor, reverence for Confucius, devotion to public welfare, admiration for martial spirit, and respect for industrial development.

3. The carrying out of a National Educational Survey in 1907 for the investigation of local educational conditions.

4. The adoption of a Special Educational Programme in 1908, with a view towards the establishment of a Constitutional Government.

5. The installation of a National Inspectorial System in the twelve educational divisions in 1909.

6. The convention of the First Central Educational Conference held at Peking, in 1911, to discuss such vital problems as Compulsory Education, Military Training, Supervision of Normal Schools, Unification of Chinese Language, Co-Education in Primary Schools, etc.

7. The adoption of a new Administrative System by the appointment of Commissioners of Education to each Province for the purpose of controlling educational matters.

8. The creation of Educational Bureaus for the supervision of Chinese students in Europe and America, 1907; in Japan, 1908.

The above-mentioned numerous measures did more than the provision of paper schemes, for, from 1905 to 1911, the Modern Educational System was actually followed. It is not necessary to state that many modifications and readjustments had to be made in order to carry out such a gigantic scheme. However, according to the Third Annual Report of the Ministry of Education, published in 1911, the progress made within the period of these six years from 1905 to 1910 was encouraging.



Photo by Aeroflms, Ltd.

Air Photo of Cambridge

Looking upward from bottom of picture one sees: on left, Queen's College, part of King's College, Clare College and bridge; on right, St. Catharine's College, King's College, Trinity College, St. John's College

CHINA'S FIRST MODERN EDUCATIONAL SYSTEM, 1903.

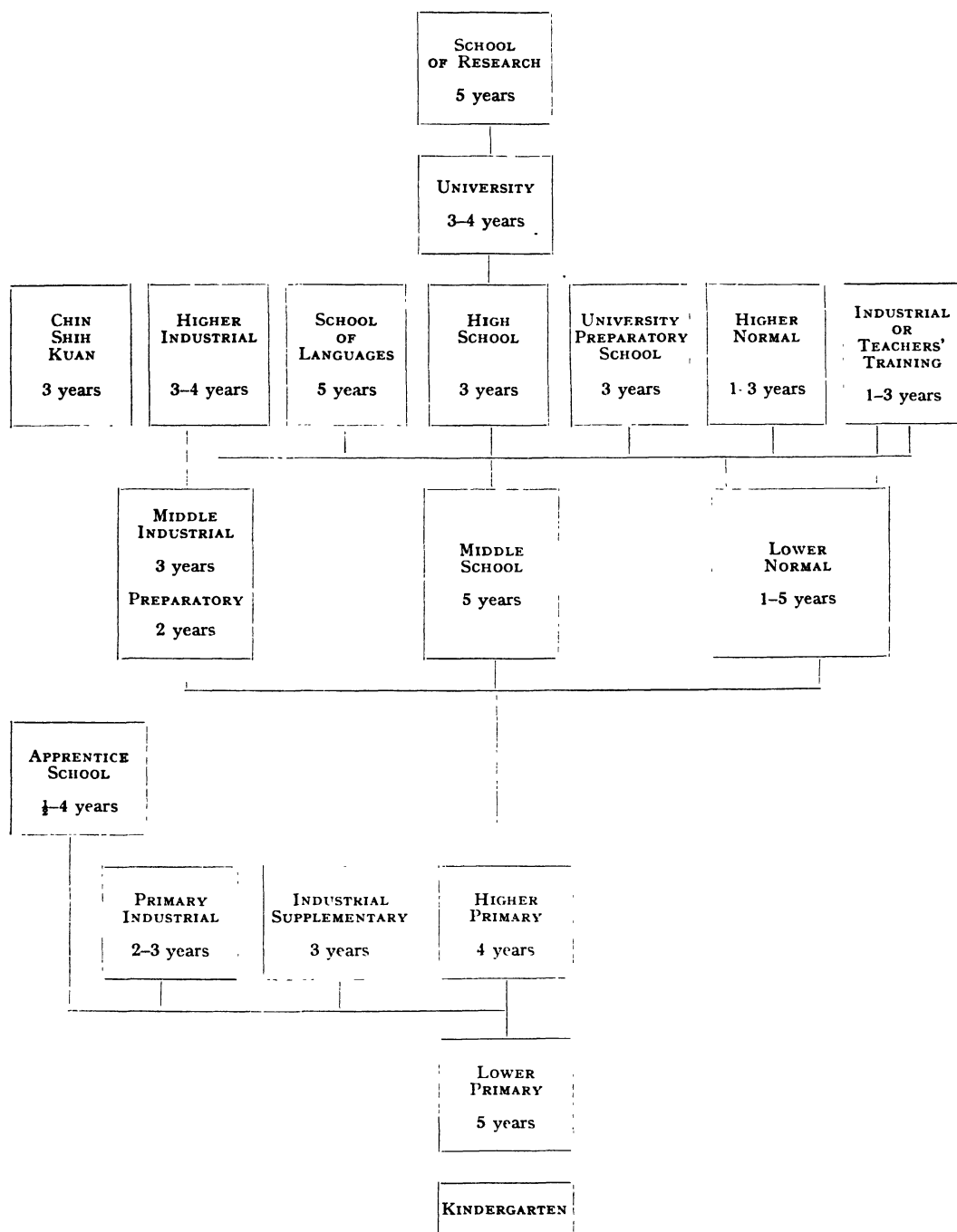


TABLE INDICATING INCREASE OF SCHOOLS.

Year.	Governmental.	Public.	Private.	Totals.
1905 .	3,605	393	224	4,222
1906 .	2,770	4,829	678	8,277
1907 .	5,224	12,310	2,296	19,830
1908 .	11,546	20,321	4,046	35,913
1909 .	12,888	25,688	4,512	43,088
1910 .	14,301	32,254	5,793	52,348

TABLE INDICATING INCREASE OF STUDENTS.

Year.	No. of Students.
1905 . . .	102,767
1906 . . .	200,401
1907 . . .	547,064
1908 . . .	921,020
1909 . . .	1,301,168
1910 . . .	1,625,534

The number for 1910 includes 5,000 students in Japan, 380 in Europe, 600 in the United States.

In 1910 China's educational system had a teaching force of 89,766, with 95,800 administrative officers. There were 69 boards of education, 722 local, provincial, and national educational associations; 1,558 educational exhorting bureaux; and 3,867 public lecture halls. The total annual expenditure on national education was 24,444,307 taels, and the national educational property was valued at 70,367,882 taels.

The year 1911 saw the Revolution in China and, with the establishment of the Republic, a new impetus was taken to educational efforts, as shown by the number of students for 1913, which had increased to 2,848,214, and the annual expenditure on education, which became 28,350,890 taels.

Educational Work of the Republic. The Civil War necessarily gave a severe blow to the cause of education, from which it will require several years to recover; and, had it not been for the great political unrest leading up to the recent movement for the restoration of the monarchy, some more constructive and permanent measures could have been carried out. However, as soon as the Provisional Government was organized at Nanking on 9th January, 1912, a temporary educational policy was prepared in order to inculcate republican principles among the people.

In 1912, Yuan Shih Kai was elected as President of China, and the new Ministry of Education called the Emergency Central Educational Conference. The delegates of the Conference were carefully selected, and they represented all the sections of the country. The second important step taken by the Ministry was the promulgation of the republican aim of education, which consisted in the cultivation of virtues or moral character in the young. This moral teaching is to be supplemented by a threefold industrial, military, and aesthetic education. The first educational ordinance of the Republic announced the scheme for the reorganization of the Ministry of Education as passed by the National Assembly. This new scheme provides the Ministry of Education with a general council and three bureaux. The Council takes charge of all matters relating to schools under the control of the Ministry—teachers in public schools, educational associations, investigations and compilations, school hygiene, organization

and maintenance of school libraries, school museums, and educational exhibits. The three bureaux each take charge of general education, technical education, and social education.

In 1913, the National Inspectoral System of Education had eight divisions, namely: (1) Chili, Fengtien, Kirin, and Heilungkiang; (2) Shantung, Shansi, and Honan; (3) Kiangsu, Anhui, and Chediang; (4) Hupeh, Hunnan, and Kiangsi; (5) Shensi and Szechuen; (6) Kansu and Hsinking; (7) Fukien, Kuangtung, and Kuangsi; (8) Yunnan and Kweichow. Each territorial division is provided with two Inspectors of general and social education, who are expected to report upon educational administration, educational conditions in schools, school finance, school hygiene, conditions relating to the work of education officers, social education and its agencies, and matters especially indicated by the Minister of Education.

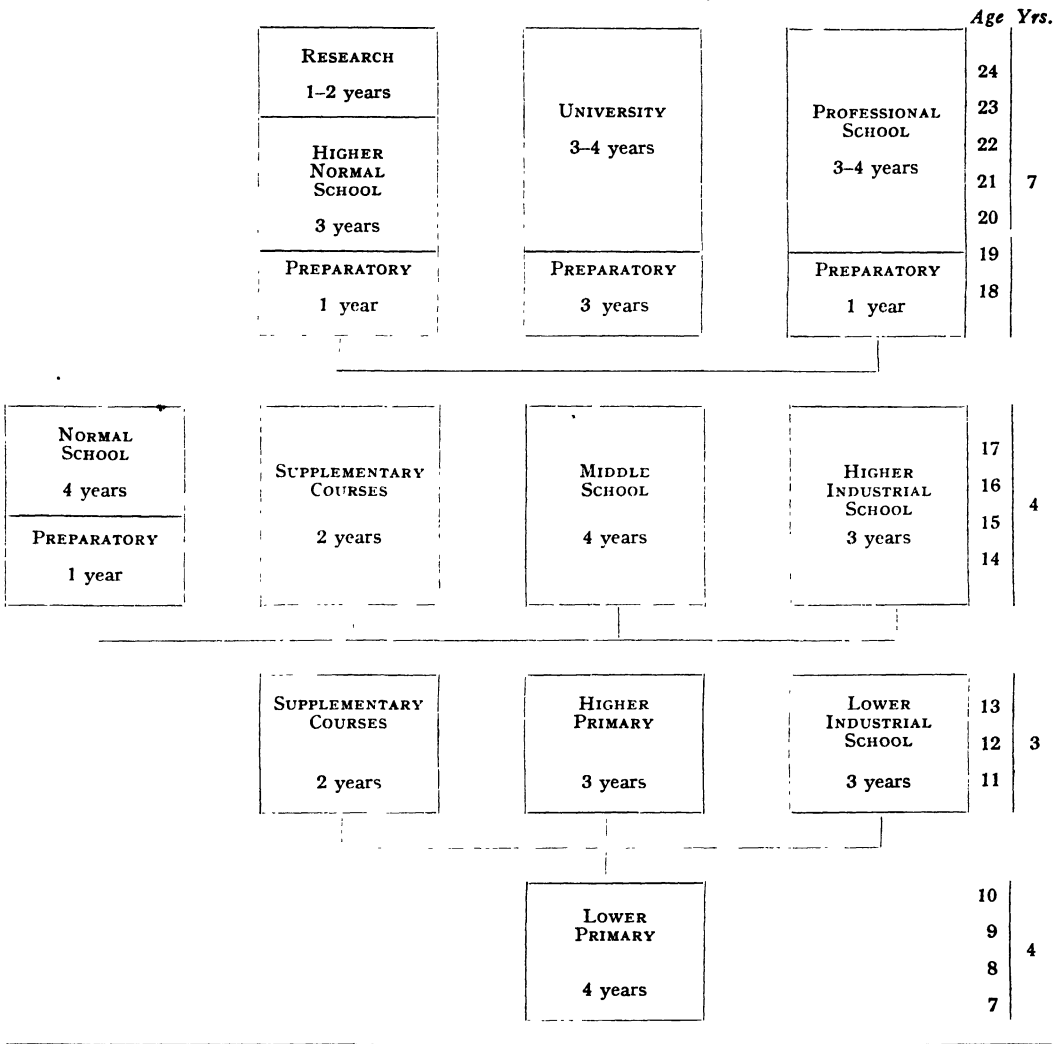
The system of provincial and local administration of education has not been unified, but, in the main, most provinces have departments of education, with Commissioners at their head. The provincial inspectors are appointed by the governors of the provinces. In the districts, the local educational bureaux become an integral part of the district administration, hence the chiefs of the bureaux and district inspectors are appointed by the district magistrates. In cities, towns, and villages, educational affairs are controlled by the local gentry, who are empowered by the voice of the people.

The Present System. On the subject of the Reorganized School System under the Republic, it is necessary to be more explicit, as this is the existing system of the present day.

On the opposite page we give a graphical chart of the organization of the New School System, 1912, with a scale for the age of the pupil.

To follow the chart, we find the four years in the Lower Primary School to be compulsory education, and the responsibility for the provision of such schools falls upon the local governments. The subjects taught are elementary, and consist of Chinese language, arithmetic, manual work, drawing, singing, physical culture, and morals. The Higher Primary Schools are established by the district officials, and Chinese history, geography, nature study, and one foreign language are added to the subjects of the Lower Primary Schools. The provincial authorities, as a rule, have charge of the Middle Schools, although private institutions fulfilling the conditions are also recognized. As a large proportion of the citizens are not likely to go beyond this stage, universal history, physics, chemistry, civics, and economics are introduced. The University, as the highest institution of education, is to be established by the Central Government. Five million dollars have recently been allocated for the establishment of five universities, but, for the time being, the Peking University is the only one which approaches the standard of a university. Realizing the inadequate provision for higher education, large numbers of students are being sent abroad, both privately and at Government expense, to complete their education. In the University, three alternative groups of studies are provided as a preliminary qualification for one of the seven faculties of Arts, Science, Law, Commerce, Medicine, Agriculture, and Applied Science. Besides this classical progression of education, it might be mentioned, in passing, that either private

CHINA'S NEW EDUCATIONAL SYSTEM, 1912.



individuals or the Government could establish schools for law, medicine, pharmacology, agriculture, commerce, mercantile marine, art, music, applied science, or languages; while for the lower grades, special provision is made in the form of industrial schools. The chart also gives two types of Normal School, namely, the Higher and the Lower, with a further division provided between the sexes. The Supplementary Courses are offered in the spirit of Continuation Schools for those who are deficient or for those who are unable to attend higher institutions of learning.

Missionary Influence. In a general survey of China's educational systems, the educational work accomplished by the Christian missionaries from Western nations cannot be ignored. Although the work was originally based upon evangelistic and philanthropic grounds, the influence derived from such enterprises for the Church fully revealed the

necessity and importance of educational work. In 1912, it was estimated that about 100,000 pupils were enrolled in the 10,000 schools conducted by the missionaries. In some thirty cases, the principals of these institutions, considering the standard of the studies offered, deemed it justifiable to call them colleges, and in ten cases the name of university was adopted. Recently, interdenominational union colleges have been organized in several centres to avoid overlapping and to raise the standard of the curriculum. At one time, these missionary institutions formed the only recruiting ground of teachers to supply the schools of the modern educational system, so the pioneer work done in modern education by the religious bodies served as a very important connecting link during the transition of China's educational system from the old to the modern.

Chinese Students Abroad. We have already

mentioned the earlier educational missions of 1872 to the United States of America, and of 1876 to Europe; but it has been to Japan since 1900 that the largest number of students have resorted for a modern education. At one time the exodus reached 15,000, and Japan had to establish special institutions to accommodate them. In the course of a few years the returned students from Japan were to be found throughout the country actively contributing to the cause of reform and progress.

In 1907 the Kiangsu Provincial Government, for the first time, held competitive examinations for the selection of students to go to the United States. As a result of three days' examinations, ten male and four female students, all qualified to enter colleges, were chosen. In the following year, the Chekiang Province sent twenty students under similar conditions. Beginning from the year 1909, the Tsing Hua College of Peking annually selects a group of students to study in the United States in appreciation of the Boxer indemnity returned by that nation to the Chinese Government; and, in 1915, ten girl students were selected, in addition to the boys. To the different countries of Europe, the Government Departments, the Provincial Governments, Government schools, and wealthy parents have sent a continuous stream of students for higher education. To-day, for both the Government and private students, there are about 5,000 students in Japan, 1,000 in the United States, 150 in the United Kingdom; and, before the war started, 80 in France, 70 in Belgium, 60 in Germany, 10 in Austria, and 10 in Russia. We take pains to give these figures in consideration of the tremendous influence the students are bound to play as leaders of advanced thought among their fellow-countrymen and fellow-countrywomen, especially when we remember what part was played by a far smaller number of their predecessors.

Although the Central Government, the Provincial Governments, and private individuals are earnestly endeavouring to multiply schools for the sake of universal education, and to establish higher institutions of learning with a view to raising the standard of education, it is necessary to appreciate the numerous difficulties that must be surmounted before the objects could be realized. Among the chief ones might be mentioned the inadequate supply of teachers, the problem of finance, the question of a universal spoken language, the system of a simplified form of writing, and the eradication of the traditional attitude towards education and Government service. Truly has it been said that China has only begun to grapple with the problem of education as, according to a rough estimate, only 3,000,000 (7 per cent.) out of a possible 40,000,000 young people of the school age have been provided with educational facilities. The great hope, however, lies in the innate fondness and respect that the Chinese people have for learning. Since an encouraging beginning has already been made in modern education from 1905, despite the great political changes and unrest, the cause of modern education is bound to gain momentum and produce desirable results within the next ten or twenty years.

Y. S. T.

CHINESE, THE TEACHING OF.—(See ORIENTAL EDUCATION IN GREAT BRITAIN.)

CHIVALRY AND EDUCATION.—Roughly speaking, chivalry was a guild of the nobility in which

warfare, especially in the cause of religion, became a recognized craft or profession. The various laws, usages, and distinctions of chivalry correspond to the codes and regulations of the craft-guild. The early universities were guilds of teachers, similarly associated with the Church. Chivalry sprang from feudalism, and essentially included the idea of service—service to war-ideals, to the protection and expansion of the Church, and to the cause of some woman to whom the knight had vowed his devotion, and to the cause of the weak and depressed generally—"to ride abroad redressing human wrong." The chivalric ideal was especially prominent from the eleventh to the sixteenth century. It is identified with the Crusades. Horsemanship (for chivalry is *chevalerie*) was clearly necessary, in earlier ages, for travelling as well as for war. Physical prowess and command of material conditions were necessary to the knight; but sustained military expeditions gave scope for exercise of courtesy to equals, loyalty to superiors, and keen sense of honour everywhere. The element of internationality distinguished the successful crusader. Hence, chivalry, which was the great alternative profession to the Church, was a civilizing agency amongst the men of action of every country in the Crusades. Two of the chief orders of chivalry were associated with crusading expeditions to the Holy Land.

Hospitallers and Templars. First there was the society connected with the hospital dedicated to St. John the Almoner at Jerusalem, which was endowed with lands in Brabant by Godfrey of Bouillon in the middle of the eleventh century. Its brethren and sisters wore the 8-pointed Cross. This Society soon became especially a military order, and received grants of property from all parts; and hospitals were erected in various countries. In the thirteenth century it is said to have included 15,000 knights, who lived on the plainest fare, wore simple clothing, and were "the servants of the poor"; and undertook at any time to fight against the Saracens. These hospitallers were established at Malta as their leading settlement in 1530. The second great order was that of the Knights of the Temple, established in 1118 by Baldwin II, King of Jerusalem, to "conquer and maintain the sepulchre of the Lord, and to defend the outposts of Christendom." The Templar churches everywhere preserved the circular form. At the beginning of the fourteenth century, the Order of the Knights Templars was suppressed. The possibilities of these two Orders as educational institutions were perceived by Pierre Dubois (*q.v.*), c. 1305-1307, who advised a union of the two Orders and a colonizing of parts of the East, with a view to systematic organization of the educational forms of the West, to dwell with and convert the Oriental population, by a highly-developed education of suitable men and women from all parts of Europe, the funds for which were to be supplied by confiscation of inefficient religious houses. The most significant part of the scheme was that for the education of women by lay-mistresses. The reverence for women so characteristic of the romances of chivalry was turned to educational implications in Dubois' *de Recuperatione Terrae Sanctae*.

Character and Education of a Knight. The typical knight, as described in Chaucer's Prologue to the *Canterbury Tales* (c. 1387), "had ridden" and fought in all parts of Christendom as well as of "hathenesse," and "never yet no villainy ne said."

Chaucer describes also the son of the knight, the squire, as "courteous, lowly, and serviceable."

For knighthood had to be won: it was not hereditary. It was based on personal service, and, after 7 years of age, the child proposed for a military career was sent to the castle of some nobleman to serve as a page or squire. (See *HOUSEHOLD EDUCATION*.) The large number of retainers was swelled by these youths learning to become "gentlemen" by living in the knightly atmosphere. By attendance on ladies, they learned courtesy, etiquette, and chivalric expression. By the men they were encouraged to compete in outdoor occupations, particularly in horsemanship, jousts, and tournaments. As the student had his Seven Liberal Arts, the young squire had his seven *Probitates*, viz., reading, swimming, shooting with the bow, boxing, hunting, chess-playing, and verse-making. Training in its highest developments may be seen in the account of "henxmen" or servants at King Edward IV's Court. The master of these youths was to "lerne them to ryde clenely and surely; to draw them also to jousts, and to lerne them theyr harness." They also learned modern languages; and harping, piping, singing, dancing, and particularly their manners, according to the "*book of Urbanity*" (Liber Niger in *Household Ordinances*, p. 45, quoted by F. J. Furnivall: *Education in Early England*, p. ii). But throughout, the principle underlying the training was that of obedient service; personal attendance on the lord, day and night; the page or squire attending him at the tournament or on the battle-field; sleeping in his room, or at the chamber-door outside. Girls were similarly trained in the retinue of ladies in personal service, in good manners, playing of musical instruments, singing, and in the art of conversation. Spinning, weaving, and clothes-sewing, as well as embroidery (often elaborate) were taught. The romances show how the young lady was not only skilled in concoction of herbs, preparation of potions and plasters, but also in the surgery of wounds, dislocations, etc. To these disciplines should be added the mediæval exercises of religion at all stages.

Educationally, an attack was made upon chivalric romances by Vives and by Ascham. The latter says in *Toxophilus* (Giles' edition, p. 7): "In our fathers' time, nothing was read but books of feigned chivalry." The death-blow was given to these books by Cervantes' *Don Quixote* (q.v.). On the other hand, in *Don Quixote* there also (Part I, Chap. XXXVIII) occurs a discourse comparing "Arms and Letters," in which the avocation of knighthood receives treatment, apparently preferential, over the studies of the scholar. The educational effort of the literary side of chivalry applied to religion—the sense that all life is a warfare, is seen particularly in Edmund Spenser's spiritualized chivalry of the *Faery Queene*.

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CHOREA.—(See *INSANITY IN CHILDREN*; *NERVOUS DISEASES OF SCHOOL CHILDREN*.)

CHORISTERS' SCHOOLS.—From the establishment of the first cathedral school by St. Augustine at Canterbury, it became the practice of the founders of cathedrals and monasteries to make provision for the education of choristers. Before the Reformation, many such schools came under direct patronage of the monarchs; and Henry I aided the Choristers' School attached to St. Paul's, London, which was richly endowed with revenues of lands at Fulham, Ealing, and elsewhere. Edward II bestowed patronage on the schools at Salisbury and Lincoln, and his son also granted endowments to Lincoln. On the establishment of Eton College, Henry VI made provision for sixteen choristers, who were boarded, lodged, and educated there, besides enjoying other privileges. Under Edward III, the vocal choir at Bangor became famous for its music. Similar provision was made when the great colleges of Oxford and Cambridge were established. All monastery schools and many cathedral schools were abolished at the Reformation; but Henry VIII re-established some of the latter, besides founding new schools. In these cases, provision was made for a free school with a music-master, and the endowments were sufficient to maintain from eight to twelve boys, and often to make them a monetary grant on superannuation. In some cathedrals, the boys were taught by the precentor and the cardinals, assisted by a grammar master; while their general well-being was watched over by the almoner. In others, the boys attended the city grammar school, but obtained their musical training in the cathedral. In Tudor times, the choristers of St. Paul's and St. James's Palace often took part in concerts and stage-plays. Shakespeare jealously refers to the former as an "airy of children" who were "now the fashion" (*Hamlet II, 2*); and, in 1583, the latter were formed into a company of players.

CHRISTIAN BROTHERS.—The "Institute of the Brothers of the Christian Schools" is a religious Society approved by the Church, having for its object not the taking of holy orders, but personal sanctification and the Christian education of youth, especially of poor children. It directs free elementary schools, but will accept the direction of any kind of educational institution for males, provided Latin is excluded.

Jean Baptiste de la Salle. The brotherhood was founded, in 1680, by Jean Baptiste de la Salle, a canon of the metropolitan church at Reims, France. In the seventeenth century, teachers of poor children in France were few; and the more clever of them were engaged in educating the children of the wealthy, who remunerated them for their services. Gratuitous schools existed, but the work which de la Salle undertook was to provide them with teachers and fixed methods. From the first, he was encouraged by Père Barré, who had founded a society of teaching nuns, Les Dames de Saint Maur, but it was only by prudent methods and persistent effort that he overcame the many obstacles put in his way by others entertaining different views. The new teachers opened their first regular novitiate in 1684; and, in 1688, were established at St. Sulpice, Paris, where their headquarters remained till 1705. The Institute was re-organized by de la Salle several times, and normal schools—styled "seminaries for country teachers"—were created. De la Salle removed his work to Rouen in 1705, where he composed the rules to

govern the brotherhood, and where he died in 1719. He had taught in schools at Reims, Paris, and Grenoble, and had composed several works of instruction for both teachers and pupils; and his followers were animated by the same religious faith and reforming zeal as himself. He advocated vigilance in guarding children from evil, good example, and instruction in useful knowledge, especially in the truths of religion. He and the Brothers made Catechism the chief subject of religious instruction. The Brothers considered themselves principally religious instructors, and took the vows of poverty, chastity, and obedience; they took also the vow to teach poor children gratuitously and to remain in their institute. In order to attach the Brothers permanently to the teaching of the poor, de la Salle forbade them to teach Latin.

The Institute. The Institute is governed by a Superior-General, elected for life, and twelve assistants. Visitors undertake the government of districts, and directors take charge of individual houses. The age for admission to the novitiate is 16 to 18 years, and for two or three years younger members may pass through a junior novitiate of study in preparation for the novitiate proper. At 18 years they take annual vows; at 23, triennial vows; and at 28, they may be admitted to perpetual profession.

Teaching Methods. The methods of teaching enjoined by the founder followed the traditions of older teaching bodies, such as the Benedictines and the Jesuits; but he introduced the employment of the simultaneous method, and of the vernacular in teaching reading. The subjects of instruction were reading, writing, and arithmetic; and in the Paris schools, drawing and a manual trade. De la Salle transformed the pedagogy of the elementary school; he required all his teachers to give the same lesson to all the pupils of a class, to question them constantly, to maintain discipline, and to have silence preserved. Before de la Salle, scarcely any educators, except the masters of the Port Royal School, had thought of using the vernacular.

Progress and Growth. At the death of de la Salle, the Brothers numbered 274 in twenty-seven houses, and were educating 9,000 pupils. By the time of the Revolution, 920 Brothers were educating 36,000 pupils (1790). Louis XV granted legal recognition to the Institute in 1724, and Pope Benedict XIII recognized it as a Catholic congregation. The schools of the eighteenth century were generally confined to towns of France; and boarding establishments were founded in Marseilles, Angers, and Reims, where more advanced education was given; while at maritime towns, hydrography and advanced mathematics were taught.

In 1792 the Order, then under its most famous superior, Brother Agathon, was suppressed, and many of the Brothers, including the Superior, were imprisoned. Napoleon restored the Order in 1802, and efforts, energetic and successful, were made during the following years to re-unite the members and revive the work. From that time till 1874 was a period of expansion; and when Brother Philippe died, there were 10,235 Brothers with 35,000 pupils.

In 1904 the French law, abolishing teaching by religious bodies, put an end to the work of the Brothers in France; but between 1904 and 1908, over 200 houses were founded in other countries, including twenty-five in England and Ireland.

In London, the Brothers have a college and an academy; in Manchester, an industrial school; and in Waterford, a training college approved by the Government. (See also ROMAN CATHOLIC CHURCH, THE TEACHING ORDERS OF THE.)

CHRISTIAN KNOWLEDGE, THE SOCIETY FOR PROMOTING.—(See CHARITY SCHOOLS.)

CHRISTIAN SCHOOLS, EARLY.—In the primitive Christian Church the Apostles were the first teachers. Irenaeus writes of Polycarp that he was not only taught by the Apostles, but that he always taught the things he had learnt from them. The first schools established by the Christians were the catechetical schools (*q.v.*), where candidates were prepared for baptism. The first and the most famous of these was at Alexandria. Other institutions were added of a controversial character for the purpose of examining the doctrines revealed in Scripture, and of cultivating the habit of argument and disputation. The school at Alexandria provided elementary education as well as theology. The early Church appreciated erudition, and employed eminent scholars in the work of teaching. Clement of Alexandria, who was especially conspicuous for his learning, taught here for thirteen years. Origen, also famous for his learning and teaching capacity, was a teacher of grammar in the catechetical school. In the first five centuries of the Christian era, the Christians sent their children to the imperial schools; and Constantine, in the year 313, gave freedom to Christians to learn and to teach in public schools. In 362, Julian the Apostate forbade Christians to teach rhetoric or grammar, but they combined to resist the prohibition, and Valentinian revoked the law. The Christians felt many objections to sending their children to pagan schools, and at an early period the bishops began to open schools in their own houses. This practice developed into the establishment of cathedral schools (*q.v.*), and a seminary was attached to the Lateran Church, the Pope's first cathedral. Education was, however, taken up in a spirit of antagonism to the teaching in pagan schools. Tertullian denounced pagan teaching as ineffectual and immoral, and the patriarchs of philosophy as patriarchs of heresy. Even Augustine of Hippo called them "croaking frogs," and advised all Christians to refrain from all heathen writings, which were likely, he said, to turn aside from the faith those who were weak of understanding. But Augustine was influential in inducing the Church to recognize the value of arts and philosophy in the education of a Christian, because of their usefulness and needfulness for an understanding of the Scriptures. In his treatise *On Christian Instruction*, he says: "Let every good and true Christian know that truth is the truth of his Lord, wheresoever it be found." Augustine had been a teacher of rhetoric before his conversion, and a writer on seven of the arts, and he recommends to Christians grammar, dialectics, music, rhetoric, geometry, arithmetic, and philosophy. Augustine was followed by Cassiodorus (468-569), who wrote copiously on education and was, with Boethius and Isidore, an influential authority in Christian schools. With these leaders came the development of Christian school learning in the midst of the barbarism which destroyed civilization in Western Europe and, with it, education in the Roman imperial schools.

CHRIST'S HOSPITAL.—This "religious, royal, and ancient foundation" derived its name of "Hospital" from the conditions which arose in the City of London after the suppression of the religious houses. Its name of "Christ's" was due to the title of "Christ Church"—"*nomen ecclesie Christi infra Newgate, London*"—which Henry VIII had given by Letters Patent, 13th January, 1547, to the former church of the Grey Friars, whose house (*cf.* C. L. Kingsford: *The Grey Friars of London*, 1915, p. 217) was dissolved 12th November, 1538, and whose Church was then made parochial. Henry VIII's letters patent assigned the lands and buildings of the Franciscans, which he had previously tried to sell to them, to the Mayor and Commonalty and citizens of London as Governors of the House of the Poor, called St. Bartholomew's Hospital (Trollope: *History of Christ's Hospital*, App. xiii–xxix). Some proposals were at once made by the citizens to adapt the buildings to charitable uses; but it was not till early in 1552, after a public appeal by Ridley, Bishop of London, that Edward VI urged the Mayor (Sir Richard Dobbs) and the citizens to a businesslike effort (R. Grafton: *Chronicle*, ed. 1809, ii. 529). The nature of the need was investigated (*cf.* John Howes' MS., 1582, ed. W. Lempière, p. 21); large sums were subscribed; and it was agreed that Christ's Hospital should take over the Greyfriars' buildings as a home chiefly for destitute children.

Constitution and Early History. On 6th October, 1552, at the Hospital, a board of thirty Governors was appointed, including Richard Grafton, the King's printer, who had his press within the grounds of the Hospital, and who became its first actual Treasurer. In November, 1552, 280 children (boys and girls) were received into the Hospital, and 100 infants were put out to nurse. Edward VI signed an indenture of covenants conveying certain lands and power to acquire more, 12th June, 1553; and the Charter received the royal seal on 26th June, 1553.

The list of the first staff shows the nature of the institution at its start. It combined the essentials of a Tudor grammar school with those of a children's hospital; there were teachers of grammar, writing, music ("Pricksong"), and A B C "for the Petties"; there were also two surgeons, a matron, and twenty-five nurses. The foundation continued to give medical aid to various folk for many years after it had begun to develop on educational lines (E. H. Pearce: *Annals of Christ's Hospital*, 2nd ed., 1908, p. 39).

Buildings and Dress. The buildings which the school inherited from the Franciscans were arranged round the great and the little cloisters, and the south portion of the great cloister remained till after the removal to Horsham. They included the library over the north cloister, which was built by Richard Whittington, d. 1423, and survived till 1832. There was a general reconstruction, under Wren's supervision, after the havoc wrought by the Great Fire in 1666; and another in 1820 and following years. But while the buildings changed, the Tudor dress remained much as it had been when the children appeared in it at the Spital ceremonies at Easter, 1553. In the case of the girls, it has been modernized since 1876; the boys still retain it with the exception of the caps and the yellow petticoats, which were abolished about sixty years ago. The dress has tended to the continuance of national interest in, and esteem for, the foundation;

and the public appearances of the boys at the Easter and the St. Matthew's Day ceremonies in the City, and at the Lenten "Suppings" in the great hall, added to its popularity as an institution.

Development of the education, after the early similarity to a poor-law institution was thrown off, followed the normal lines of a grammar school. For some time, the "mayden children" as well as the boys, were accommodated in the London buildings. Since 1779, the girls have had their own separate school at Hertford. Their curriculum, till recent times, was very elementary, and their numbers were small. But, from the first, the boys competed successfully in scholarship against those of other public schools. There is a long line of exhibitioners, beginning in 1566, who have proceeded to the universities; and, as the exhibition fund is well endowed, it is possible to award six or seven exhibitions yearly to boys who have won scholarships at various colleges. The list contains some famous names, but the general standard of creditable attainment is its notable feature.

History since the Restoration. The Restoration brought to Christ's Hospital a further sense of public interest in its welfare; for Charles II was induced by Samuel Pepys (*cf.* Brit. Mus. Add. MS. 20, 732) and others to favour the foundation of a Royal Mathematical School, the special object of which was the training of forty boys, called "Mathemats," and wearing silver-plated badges on the shoulder, for service in the King's ships. Thus, mathematics and science gained an earlier place in the interests of the school than was the case elsewhere. Training for the sea-service has gone through so many changes since the Restoration, that this branch of the school's work has, perhaps, hardly answered the exact expectation of its founders; but it brought to the Hospital the active interest of Sir Isaac Newton, Flamsteed, and other eminent scientists (*cf.* E. H. Pearce, *op. cit.*, Chap. VI), and it has supplied a large number of apprentices to the Mercantile Marine, while many of its pupils have entered the Royal Navy, chiefly as engineers and assistant clerks.

Modern Administration and Conditions of Admission. It remains to say something about (1) the methods of administration; (2) the principles upon which children were admitted; (3) the changes involved in the present scheme.

1. Till 1891, the schools of the foundation were administered by the Governors. These were originally the citizens—aldermen, common councilmen, and others—who had helped to raise the necessary funds. Gradually, men were admitted Governors from outside the City in recognition of a donation of not less than £500. The aldermen retained their rights, whether they gave a donation or not; but there were, normally, 300 or 400 Donation Governors. They appointed a Committee of Almoners who governed the schools with little, if any, reference to the Upper Grammar Master or his staff. The system meant that, in practice, there were many defects in the teaching, the supervision, and the feeding of the children; but the connection between individual Governors and the boys or girls nominated by them was often of great value to the latter when starting out in life.

2. Till 1891 (save for a period at the beginning of the school's development), admission was obtained by the nomination or "presentation" of individual Governors, whose turn to "present" came round every three or four years. The system

implied that the Governor made himself responsible for choosing a boy or a girl whose parents were in real need. In a few cases, especially about a century ago, though the committee took pains to sift the merits of each, the "presentations" were given unworthily. To-day, when the State provides free education, primary and secondary, the Donation Governor is generally the source from which the most worthy and suitable cases proceed.

3. Since 1891, the foundation has been administered under a scheme of the Charity Commissioners, approved in Council 15th August, 1890, after an opposition lasting for several years. It substituted for the former method the administration of the school by a Council of Almoners representing the Donation Governors, the Court of Aldermen, the London County Council, the Universities, and other bodies. The experience of these representatives has been of immense value to the education of the children. The scheme also introduced a large element of competition into the older method of admission, places being thus allotted to children from endowed and public elementary schools. The Education Act of 1902 has made this feature of less public utility, and it could now be modified with advantage. The two outstanding benefits conferred by the new scheme were the removal of the boys' school from Newgate Street to West Horsham, and the great development of the girls' school at Hertford, which is now one of the finest of its kind (and is believed to be the oldest) in the country.

E. WORCESTER.

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CHRONOGRAPH.—An instrument which records the length of a period of time. Its essential parts are a pendulum to indicate time, and a stylus to mark on a moving surface the beginning and end of a period of time.

CHRYSOLORAS, MANUEL (1355–1415).—A famous Greek scholar, born at Constantinople. He was one of the scholars who contributed most to the revival of Greek literature in Western Europe. About 1389, when the Turkish conquerors were on the point of overthrowing the Eastern Empire, Chrysoloras was sent by Manuel Paleologus to the kings of Europe, including England, to solicit aid against the Turks. The errand failed, and Chrysoloras remained in Italy to teach Greek literature, which he did with great success at Venice, Florence, Milan, Pavia, and Rome. Among his distinguished pupils were Léonard Arétin, Léonard Bruni, and François Strozzi. He gained a great reputation as a theological scholar and an eloquent orator, and was consequently chosen as a representative of the Greek Church at the Council of Constance in 1415, though he died before the Council met. He wrote many treatises on religious subjects, of which the manuscripts only remain; and he published letters on a comparison between ancient and modern Rome, and one of the earliest Greek grammars in use in Italy (1488). (See also RENAISSANCE, THE.)

CHRYSOSTOM, ST. JOHN (called Chrysostom, or the "Golden-mouthed," from his wonderful

powers of oratory).—He was born, at Antioch, in Syria, A.D. 347, was the son of a Roman general, and his mother, Anthusa, was left a widow soon after his birth. She had him educated in the famous school of Antioch under Libanius, the heathen orator, who thought so highly of John's powers that he declared him the fittest of his pupils to succeed him as teacher of rhetoric. But under the instruction of Diodorus, afterwards Bishop of Tarsus, John became a Christian, and from Diodorus he learnt his peculiar manner of interpreting the Scriptures. Chrysostom discouraged attempts to discover allegorical meanings, preferring literal interpretation of the sacred books. He retired to an aged hermit's cell near Antioch, devoted himself to deep study, and is said to have committed the whole of the Scriptures to memory. Returning to Antioch, he entered the ministry, wrote a most valuable book on the duties of the priesthood, and another on Divine Providence, and soon became the most popular preacher in Antioch. Political tumults led to attacks on the Imperial statues, and during the troubles Chrysostom delivered a series of discourses known as the "Homilies of the Statues." In 397 he was forcibly carried off by the Emperor's officers to Constantinople, where he was compelled to become bishop. His vigorous attacks there on the profligate lives of the nobles and clergy led to his banishment, but his popularity secured his recall—only to be banished again for his sermons against the Empress Eudoxia. He was sent to a remote part of Armenia, where, after much good work and many hardships, he died in 407. Besides many homilies, he wrote many epistles, Biblical commentaries, religious treatises, and liturgies. The title Chrysostom was given to him after his death, and first appears in Christian literature about 600. The "Prayer of St. Chrysostom" does not appear in the earliest manuscripts of his liturgy, and its authorship is unknown.

CHURCH ATTENDANCE OF SCHOLARS.—The earliest Christian schools were established by bishops at their own houses or at cathedrals, and their chief purpose was to educate pupils so that they might be able to study the Scriptures. These schools were followed at an early period by the monastic schools, the song schools, and the choristers' schools (*qq v*) at the cathedrals and monasteries. In all the early schools, religion was combined with education; and the earliest reading books were prayer books, hymn books, and the Scriptures. It was the usual custom for the boys to attend services, and the instruction was often given in the church itself. Few really secular schools were established until at least the fourteenth century, but in such schools a similar practice of taking the pupils regularly to church services was observed. In the rules for the guidance of scholars at the earliest schools, and in the statutes of later schools, it was made compulsory that pupils should attend church on Sundays and on the chief festival days. Church attendance was also insisted on in the licences issued to schoolmasters after the Reformation, and in the Act of Uniformity. Compulsion gradually died out during the eighteenth century, though the practice continued of taking scholars of residential schools to church. When the National Society began to spread schools throughout the villages and towns of England, the education provided was "according to the principles of the Established Church," and every possible effort was made to promote regular church attendance of

the scholars. Sunday schools were opened in connection with day schools and, after lessons, the children were usually marched to church. On festivals, the day-school pupils usually attended a service at church.

Mr. Brougham, in his Bill of 1820, recognized this practice, and provided that children of various religious bodies should attend the church or chapel to which their parents belonged.

The Conscience Clause of the Act of 1870 gave freedom of choice to parents in regard to religious instruction, and the Act provided that no parent should be compelled to send his child to school on a day set apart by his religious body for religious observances. This provision was definitely applied to Ascension Day by a judicial pronouncement in 1907, and on that day pupils of schools belonging to the Church of England are usually taken to church.

Boarding schools, unless they are provided with their own chapels, usually send their children to a church on Sunday.

CHURCH, THE EARLY BRITISH.—Wales, deprived of the influences of a university until the last quarter of the nineteenth century, has from as early as the sixth century inherited a university tradition, which recent research is transforming from tradition into history. The sixth century was the great age of the early British Church and its monastic institutions, of which the chief—Llanilltud, Llanccarfan, and Llandaff in South Wales; and Bangor Iscoed in North Wales—besides being monasteries conforming to the rigid discipline of the Celtic rule, were also, in reality though not in name, the university of the princes, chieftains, and bards of the nation.

The Welsh Monasteries. The age of the British Church was, for Wales, a point of brilliant light in the Dark Ages. If Pelagius¹ received his education at Bangor Iscoed, it argues a certain breadth in the intellectual outlook of the monasteries. Their teachers were eminent for the study of the Scriptures, having long had in use an old Latin version of the Bible, as evidenced by Gildas's quotations from it, different from the Vulgate. Their literary distinction is seen in the "Gododin" of Aneurin, a Welsh poem which, by reason of the academic environment in which it received its form, is also classical and the model of "epic" diction for later poets. Rhys's account of the growth of the Welsh "englyn" from the Latin hexameters used in memorial inscriptions, in which the metrical gave way to an accentual rhythm, as in the early sixth century inscription to the great teacher Paulinus, suggests a further channel of British monastic influence on Welsh poetry, which is seen again in the "englynion" in the Juvenius MS., and the accentual hexameters of the Luxembourg folio, whose home must have been, according to Zimmer, "Llantwit Major, the great school of Illtud in the sixth century."

In Gildas's *De Excidio Britanniae*, the asceticism of the monks appears in the self-lacerating guise of contribution for national sin in the life of St. David, in the more tender and alluring form which shed its glamour on the Court of Arthur.

¹ "The language and style of Pelagius and Fastidius lead us to infer that the schools of the Empire, provided by Municipal bodies, did their work well in Britain." (H. Williams, *Christianity in early Britain*.) Such schools may have existed in Wales in the towns, such as Caerwent and Caerlleon.

A subsequent stage of the monastic-academic Wales is marked by the *Historia Britonum* of Nennius, the storehouse "of the matter of Britain" in the ninth century; and by the Laws of Hywel Dda codified by a national council in the tenth century at Whitland (Ty-Gwyn-ar-Dâl), once the seat of the school of Paulinus, *cultor pietissimus aequi*.

St. Davids. The great monasteries had meanwhile been devastated by the marauding invader. One great school, that of St. Davids, a monastery dating from the sixth century, apparently weathered the stress of events and maintained a tradition of learning to the end of the eleventh century, when the calligraphy of the School of Sulen had a characteristic or national form.¹ About 885, it gave Asser to be the educator and biographer of King Alfred; and, in the twelfth century, it educated Gerald the Welshman until he went, "about twenty years after the death of Abelard and thirty years after that of Bernard of Clairvaux," to the University of Paris, then thronged by students of all nations.

Gerald's *Cambriae Descriptio* and his *Tractatus de Illaudabilibus Walliae* are examples of books which, by virtue of the influences under which their author passed as student and teacher at Paris, blended with his Welsh patriotism, have contributed to the making of Wales. Hardly any section of equal size could have exceeded in influence the tenth chapter of the second book of *Cambriae Descriptio*. Under a more favourable star and in a less turbulent time it would, perhaps, have been the mission of Gerald, a great academic figure and a humanist, to be the founder of a university at St. Davids. About 1146, the year of Gerald's birth, another great book, the *Historia Regum Britanniae*, was published by Geoffrey of Monmouth, who was or had been a teacher of the youth of the nobility at Llandaff. E. H. G.

CHURCH OF ENGLAND SUNDAY SCHOOL INSTITUTE.—The Institute was founded in 1843 for the extension and improvement of Church of England Sunday schools. To carry out this work, it promotes the establishment of local associations (ruridecanal or otherwise) of clergy and Sunday school teachers in union or correspondence with the Institute. It provides much assistance in the form of literature, such as manuals of lessons, organization and teaching, tracts and magazines, and other works useful for Sunday school teachers. Experienced visitors are sent to attend local meetings to give lectures and training lessons, as well as to visit Sunday schools with a view to suggesting plans for their improvement.

The Institute publishes the *Church Sunday School Hymn Book* and the *Church Sunday School Magazine* (a monthly paper with a large sale).

For the training of efficient teachers, the Institute has founded a training college (St. Christopher's), which was opened in 1908, and has been attended by an average of about twenty students each term.

The Institute holds examinations for teachers, once a year, on Holy Scripture, the Prayer Book, Church history, class management, and the art of teaching. Certificates are awarded to successful candidates, and a number of prizes to those of special merit.

At the Institute (Serjeant's Inn, Fleet Street) is

¹ Lindsay, *Early Welsh Script*, p. 52.

a museum of Biblical interest containing a collection of objects from the East, as well as models of places and things mentioned in the Bible. There is also a library of reference from which books may be borrowed by subscribers.

There is a Bible Reading Union in connection with the Institute, and monthly *Notes on the Readings* are sent out to readers.

For many years the Institute has organized a Church Sunday School Choir; and since 1880 has held choir festivals of some thousand voices at the Crystal Palace.

CHURCHES, EDUCATION IN THE EARLY.—

Little is known of the education of children among the Jews. The Jewish child was taught at home out of the law by his parents. Thus we are told (2 *Timothy* i.) that Timothy had been taught by his grandmother Lois and his mother Eunice. We are also told that Joshua ben Gamla (Jesus son of Gamaliel), the second before the last of the High Priests, established, in all the cities of Palestine, schools which all boys from 6 years old had to attend. After school age young lads sat at the feet of some well-known teacher of the law (*Acts* xxii 2).

The Early Fathers. Origen's first care, so his scholar Gregory tells us, was to make the character of a pupil his special study. In this he followed the example of Clement. "He ascertained with delicate and patient attention the capacities, the faults, the tendencies, of him whom he had to teach. Rank growths of opinion were cleared away; weaknesses were laid open; every effort was used to develop endurance, firmness, patience, thoroughness . . . Origen taught his scholars to regard language as designed not to furnish materials for display, but to express truth with the utmost accuracy and logic; as powerful, not to secure a plausible success, but to test beliefs with the strictest rigour. This was the first stage of intellectual discipline, the accurate preparation of the instruments of thought" (*History of Religious Thought in the West*, Bishop Westcott, pp. 214-15).

So the pupil was led on through geometry and physics, "the sacred economy of the universe," as Gregory calls it, to moral science and ethics and theology. Mr. Bass Mullinger points out that the duty of the early Bishop to be not only "apt to teach" but to provide teachers led to the Catechetical schools (*q.v.*) of Alexandria, which Origen carried to Caesarea. Clemens had already (c. 209) founded such a school at Jerusalem. From Alexandria "Christian education mainly derived its inspiration during the first three centuries." The teaching was carried out by the clergy. This was a departure from the Pagan practice, under which the priests did not teach. Mr. Mullinger states that Christian parents who could afford to do so "sent their sons to a *gymnasium*, under the care of a paedagogus to share with pagan youth the ordinary instruction of the time."

The Roman Empire. The empire shows us two classes of schools: the elementary school under a "litterarum primus informator" (Tertullian, *de Pallio*, chap. V) where the boys were taught to read with correct accents and began grammar; the higher school, governed by the *grammaticus* or *rhotor*, was purely literary. This education was "liberally aided and endowed by the State in successive enactments of Hadrian, Marcus Aurelius, Vespasian, Valentinian I, Gratian and

Theodosius" (Mullinger). It was Gratian who introduced or revived the system of public schools in Gaul, Spain and Britain. E. J. Newman, in his *Idea of a University* (p. 9), dwells on the fact that these pagan schools were used. "The gravest fathers recommended for Christian youth the use of pagan masters; the most saintly bishops and most authoritative doctors had been sent in their adolescence by Christian parents to pagan lecture halls." The result, despite protests outside the literary atmosphere of Alexandria, was a broad liberal education. Jerome (*q.v.*) himself was a pupil of Donatus the grammarian (*q.v.*). But towards the end of the fourth century the dangers of pagan teachers were more and more realized. Mr. Mullinger tells us that the two daughters of the Emperor Valens were instructed by Martianus, a presbyter of the sect of the Novatians, in grammar (Socrates, H. E., iv. 9).

Early Monastic Schools. It was more and more felt that the clergy must do the teaching, and the fall of the Western Empire made this necessary, and, in fact, limited the study of pure letters. The Monastic schools of Cassian (despite the fame of the school at Marseilles) did much to minimize the study of literature in the fifth and sixth centuries, but the strictness of the rule of Cassian as to the study of the Bible made some learning necessary. "It may, probably, be safely assumed that wherever, after Cassian's time, mention occurs of any considerable monastery in the West, there existed in connexion with such a monastery a school which imparted at least such an amount of elementary education" as enabled the scholar to read, write, sing and compute the calendar. The coming of the Benedictines in the sixth century, tended to enlarge the educational outlook, while the work of Theodore and Hadrian in England brought the larger eastern outlook on education into England, and this, which lay behind the learning of Alcuin, reacted on the narrowness of the continental learning. "It was from England . . . that the schools restored or founded by Charles the Great, in the latter part of the eighth century, derived their method and their tradition." The episcopal schools, and later the parochial schools, henceforward were to play their part beside the monastic schools, which in the ninth century became once more true schools of learning.

J. E. G. de M.

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CHURCHMEN AND EDUCATION.—(See RELIGIOUS TEACHING IN STATE-SUPPORTED SCHOOLS.)

CICERO (106-43 B.C.), the orator; became famous as a pleader in the Roman forum, and rose to high offices of State. His greatest political work was the suppression of Catiline's conspiracy. As an author, he presents the Latin language in its highest perfection. His writings include seven rhetorical works, the chief being *De Oratore*; philosophical works dealing with politics (*De Republica*), morals (*De Officiis*), and theology (*De Natura Deorum*); Orations; and Epistles. His *De Amicitia* and *De Senectute* are widely read by classical students.

CICERONIANISM.—The term applied to the close or slavish imitation of the style of Cicero, who had laid down in the *De Oratore* and *Brutus* the requirements, in the orator, for "apt," "ornate," and "copious" speaking. Quintilian, about the end of the first century A.D., in his *De Institutione Oratoria*, is the typical Roman advocate of the appeal to Cicero as the one model for speaking (in his orations) and writing (in his epistles and other work). Through early Christian times, Cicero fell into the background; still, Minucius Felix wrote on Christianity, using only classical terms for theological topics. Amongst the early Christian fathers, Lactantius preserved the Ciceronian tradition. In the Middle Ages, though Cicero was occasionally studied, he was no longer a general model. Petrarch (1304–1374) was the first of the neo-Ciceronians, and he was quickly followed by Coluccio Salutati (1330–1406), Latin Secretary of Florence, discovering that there were two MSS. of Cicero's *Letters* at Milan, and obtaining transcripts of them in 1389. The succession of ardent students of Cicero can be traced through Barzizza, Bruni, Guarino da Verona, Vittorino da Feltre, Aeneas Sylvius (Pius II); but these were "eclectic" or "rational" (i.e. ready to give precedence, but not sole sovereignty, to the Ciceronian model for composition). After the gladiatorial combat between Laurentius Valla, as a "moderate" Ciceronian, and Poggio Bracciolini, which was more marked for its ferocity than for any guiding principles, in 1490, Paolo Cortesi, in his *De Hominihus doctis*, paved the way for the narrow and strict Ciceronians whom Politian (1454–1494) characterized as the "apes of Cicero." In this slavish adhesion to Cicero's very words and phrases, Cardinal Bembo and Cardinal Sadoletto becomes the acknowledged leaders.

Of Peter Bembo (1470–1547), the Papal Secretary, at one time in the Court at Ferrara, Hallam says: "He kept forty portfolios into which every sheet entered successively, and was only torn out to undergo correction before it entered the next. He was an exclusive Ciceronian," and regarded Cicero as the "only perfect model."

Cardinal Sadoletto (1477–1547) wrote *De Gloria* and *De Laudibus Philosophiae* in his imitative Ciceronian style.

Ciceronianism was mainly an Italian development, but a notable exception is Christopher Longolius [i.e. Longueil] (1488–1522), who came from Malines—"the one barbarian allowed the name of Ciceronian," as Professor J. E. B. Mayor said.

Professor Mayor gives (Ascham's *Schoolmaster*, p. 242) an illustration of the lengths to which a "Ciceronian" version could go. The sentence is: "Jesús Christus, verbum et Filius aeterni Patris, iuxta prophetias venit in mundum, ac factus homo sponte se in mortem tradidit, ac redemit ecclesiam suam, offensivae Patris iram avertit a nobis." The rendering is: "Optimi Maximique Jovis interpres ac filius, servator, rex, iuxta vatum responsa ex Olympo devolvit in terras, et hominis assumpta figura sese pro salute Reipublicae sponte devovit Dis Manibus; atque ita concionem, sive Republicam suam asseruit in libertatem, ac Jovis Optimi vibratum in nostra capita fulmen reflexit."

Post Renaissance Developments. This "Ciceronian superstition," Professor W. H. Woodward has said, "meant the death of scholarship." In 1528 Erasmus stepped forth to attack it with the lash of sarcasm—in a work entitled *Ciceronianus*. He gives the name Nosopmus to one of the craft,

who has read nothing for seven years but Cicero. Nosopmus has made a list of all the words in Cicero, another list of all the phrases; a third of all the metric feet of the beginnings and ends of the sentences. No word or inflection can be used in his composition, unless chapter and verse can be quoted for it in Cicero. He will take a long winter's night over a single sentence.

Erasmus shows the futility of this ceaseless imitation—for religion, government, manners, studies, are all changed since Cicero's times. He adds a scathing criticism on the Ciceronians of the time, mentioning the chief scholars of the age as either good Ciceronians or as not coming up to the standard of Nosopmus and his friends. The Englishmen thus named are William Grocyn, "who could not endure Cicero's fullness of expression"; Thomas Linacre, who preferred Quintilian to Cicero; Richard Pace, who might have been a Ciceronian but for the distraction of having to conduct diplomatic business, which requires speed; and Thomas More. Erasmus does not hesitate to say that More is "not inferior in culture to Cicero" himself, whilst his style was rather that of the rhythm of Isocrates than of Cicero. Finally, Erasmus characteristically maintains that it is stupid to wish to speak otherwise than as the subject requires. Ciceronianism, in a word, is a disease, and will disappear if we summon the physician Reason.

Julius Caesar Scaliger (q.v.) entered the lists against Erasmus, but "defence" of Cicero largely took the form of abuse of Erasmus, who consulted his own dignity by declining to answer him back.

Etienne Dolet (1509–1546) had been a student at Padua, a special centre of Ciceronianism, and had studied under Longolius, whom Vives called "the most Ciceronian of all men." Dolet's treatise in 1535 took the form of a dialogue between a pupil of Longolius and Sir Thomas More as a follower of Erasmus, and was called *Dialogus de Ciceroniana imitatione*.

In the same year, Mario Nizzoli published his *Observationes in Ciceronem* (in two folio volumes), afterwards known as *Thesaurus Ciceronianus*, or Ciceronian Dictionary, a work of great industry and conspicuous value for many generations.

Marc Antoine Muret, a Frenchman, soon after the middle of the sixteenth century, himself recognized as one of the soundest of neo-Latin writers, scattered the remnant of the Ciceronians. F.W.

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CINEMATOGRAPH AS A MEANS OF EDUCATION, THE.—From a very early period in the history of cinematography there have been vague ideas of using moving pictures as a means of education. Twelve or more years ago Charles Urban had made an active start to collect a library of informative, natural history, industrial and travel films. These subjects were offered singly, on hire or purchase, to the regular picture theatre proprietor but were also available to the lecturer

and the home exhibitor. The films never became very popular in picture theatres, and as the years went on and comedy and dramatic subjects were increasingly called for, these educational or semi-educational subjects were pushed more and more into the background. Still, Charles Urban deserves credit for being a pioneer in an attempt to provide genuinely informative films for picturegoers, even though his effort turned out to be somewhat premature.

More recently, informative films have been made by private workers and also by experts employed by some of our great film producing companies. Very fine educational subjects of a scientific nature have been produced at the Marey Institute, Paris; among them are speeded up films showing the actual progress of growth of plants and the opening of flowers. At the same institute, M. Carvallo and M. Comadon have succeeded in making X ray cinematograph pictures, and M. Bull has worked at cine-micrographs and ultra speed films. A recent German development of ultra speed cinematography, in which the illuminant is a series of highly actinic electric sparks from a Leyden jar, allows of as many as 50,000 separate pictures being photographed in each second of time upon a continuously moving film band. This ultra rapid process is of use for visibly recording the progress through the air of high-speed projectiles and the form of the air currents set up by them. Messrs. Pathé Frères have invented a high-speed cinematograph camera that photographs ordinary out-door scenes by daylight at ten times normal speed (normal taking speed being sixteen pictures a second). If the over-speeded films are projected at the normal sixteen picture rate they show natural movements slowed down ten times. In this way individual muscular movements in sporting films, and in wild animals, can be studied with accuracy.

While a large number of carefully made, scientific and informative films have in the past been shown to the public in ordinary picture theatre programmes it is true that the manner of their presentation—as short “fill-ups” between comic and melodramatic amusement films—has seriously detracted from their usefulness. It is also true that a public which has paid to be amused objects to receiving instruction instead, so that to make educational films acceptable in moving picture shows, they have to be sub-titled in a slipshod way which seriously decreases their intrinsic educational value. A movement to collect these films, add others suitably made and titled, and use them as a library for teaching purposes in schools and lecture theatres has now been started but is so far only in its incipient stage. For any effort of this sort to be a success three things, at least, are necessary: (a) a supply of suitable films; (b) suitable cinematograph machines (called “projectors”) with which to show the films; and (c) the acceptance and use of these materials by educational bodies.

Companies actively at work on informative film making, besides those already mentioned, include: The Community Motion Picture Bureau, Ltd.; The Gaumont Co., Ltd.; Educational Films, Ltd.; The British Film Institute. The last named company is specializing on films of surgical operations and dissections, for the use of medical students and post-graduate students. The Community Motion Picture Bureau is forming an excellent library of films intended exclusively for school use. The Educational Film series handled in

Great Britain by Granger's Exclusives, Ltd., are excellent, but unfortunately at present not available to educationists owing to their being handled on an extremely foolish trade system known as “block booking,” whereby the user, who must be a cinema owner, has to contract to hire in regular sequence at least a dozen of the films, the choice of how the dozen shall be made up being out of his hands.

Under head (b) the last two years have witnessed the birth of a totally new type of cinematograph machine, called a portable educational projector. Its salient features are that it is self-contained and shuts up when not in use into the form of a quiet-looking leather-covered oblong box or “suit-case.” For use it is connected by flexible cord and plug to the nearest electric house fitting, when an internal electric incandescent lamp of high intrinsic brilliancy, and of 500 to 1,000 candle power, lights up to act as the projection illuminant, electric current also being fed to a small motor to run the mechanism.

These “suit-case” or “portable” projectors are comparatively free from fire risk, and their present cost is from £45 to £75. They show a fairly well lit picture on a white distempered, or aluminium surfaced, screen up to 6 ft. or 8 ft. across. Note that the height of a moving picture is three-quarters of its width. At the time of writing the patterns of educational projectors are undergoing almost daily improvement and variation. Typical examples of present day educational projectors are: the Wrench Home Projector; De Vry Portable Projector; Acme Portable Projector; Lockord Silent Animatograph; Graphoscope Junior; Cinema Traders Home Projector; etc.

Coming to (c) the necessity for educational bodies to give definite acceptance to the instructional film movement by installing projectors in schools and lecture rooms, we are here faced by a vicious circle. They can hardly be expected to do this until they can get a suitable service of the films they require, while on the other hand we cannot expect film producers to bestir themselves to make non-entertaining films until a sufficient demand for them arises. At present the London County Council is marking time over the question of using instructional films in L.C.C. schools until an educational sub-committee, recently formed, renders its report, which it may perhaps do in a year or so. Other local educational authorities, notably Ealing, have actually started school instruction by cinema films. In Scotland, education authorities are taking the matter up, and several British grammar schools and private schools have installed projectors and are doing their best with such educational subjects as are already obtainable.

While it may sound from this as though the instructional film movement was hanging fire, the truth is far otherwise. Use of films for teaching and for demonstrating industrial and other processes outside the regular cinema is far more widespread than it was only a year ago. All indications suggest that within two or three years more every serious impediment to the acceptance of instructional cinematography as a force in the land will have finally been swept away. C. N. B.

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CISTERCIANS IN WALES, THE.—The seats of the early British monasteries were occupied, where opportunity offered (as at Whitland) by Houses of the Roman Cistercian Order. They brought into Wales a new religious zeal and intellectual impulse from France and Brittany, bringing Wales face to face with her own kin nurtured under larger skies and in contact with world-moving forces.

The Cistercians of Wales and Their Influence on Literature and Learning. The activities of the Cistercians in Wales, extending from this early period to the Dissolution of the Monasteries, constitute a chapter in the history of higher education, the materials of which are now being gathered and sifted. It would, perhaps, be the history of Wales itself for the same period from a standpoint different from that of the historian, for Wales is a country in which intellectual things have always held a pre-eminence. Not only the monk, but the secular clergy, the bard, and the musician have probably at all times taught others their vocation whilst pursuing it themselves. Constant warfare interrupted the course and frequently obliterated the result of the teacher's work among the laity. The monasteries alone were places of seclusion where quiet study and instruction could go on.

Two great monasteries—Strata Florida in Cardiganshire and Aberconwy in North Wales—held a position and fulfilled functions in some respects like those of universities. As keepers of the national record of events, they had a regular means of periodical consultation, the chronicle called *Brut y Tywysogion*, kept at Strata Florida, being periodically reviewed by collaboration of an envoy from Aberconwy.

The Welsh *Mabinogion* received their final form in these or some of the other monasteries, such as Strata Marcella. This implies not only the skill of the scribe and the illuminator, but the gradual development of a prose style fitted to the matter of the stories. Early Welsh forms of these were handed down in the monasteries and gathered from the lips of the story-tellers. Fresh versions of them gradually came in from Brittany, by which their structure and the substance of the Welsh stories were affected. The achievement of the monks was to embody or preserve the stories in beautiful and simple Welsh. The virtue they have since shed like fragrance in many countries must have made itself felt in the education of the Welsh nobility of the age of the Princes.

Side by side with this process there was parallel development of poetic composition. Metrical innovation based on the study of the classical metres and the accentual and rhymed metres of the Mediaeval Church, the turning to poetical use of the Lives of the Saints, and the mystical and allegorical material of which much is contained, for example, in *Llyfr yr Ancr Llanddewibrefi*, occupied many individuals or co-operating groups of monks.

The Book of Taliesin shows the process going on before our eyes. Thus, in the great mystic autobiographical Ode, the reader seems to see blended Pythagorean lore and Christian ritual treated in a monastic school of poetry.

References to the theology and music of the Mass are not infrequent in some of the poets of the Princes. Gradually inner allegiance to the faith gives way to the more detached and ironical attitude of Dafydd ap Gwilym, whose charm yet lay in the exquisite delicacy with which things vital to the religious life were touched by him with a

fancy half impatient and half responsive to their appeal. The poem of Gutyn Owen, herald of Strata Florida, written late in the fifteenth century, asking for the loan of a horse from the Abbot of Valle Crucis, suggests the further direction in which the abbeys played the part of universities in their influence on agriculture and the economic development of the country.

Owen Glyndwr. By his day, the Wales of the Princes had passed into a Wales subject to the English Crown, and Welshmen were making their way in greater numbers to the English universities. Sion Cent shows in almost every page the effect of his education at Oxford. A fresh and arresting note in him seems to reveal contact with the teaching of Wycliffe. A large body of Welshmen who were in residence at Oxford, probably in Cistercian settlements in touch with the Welsh monasteries, joined the standard of Owen Glyndwr at the revolt in 1415.

At what time the idea arose of obtaining a Papal Charter for the establishment of universities in Wales, it is unknown; it may have existed in the great abbeys for some time before it found its first expression in the letter of Owen Glyndwr, after his revolt, to the Pope of Avignon. It is idle to speculate what would have been the result of the establishment of a university in Wales in the thirteenth or fourteenth century, which saw universities established in other countries in rapid succession. It would probably have promoted a breadth of outlook which might in Wales, as elsewhere, have "dispelled for ever the obscurantism of the Dark Age" (Rashdall, p. 707). As it was, these wider influences very gradually infiltrated from outside.

E. H. G.

CITIZENSHIP, THE TEACHING OF.—It has been generally recognized among educational leaders in this country that the training of children for the exercise of the responsibilities of citizenship is one of the most important purposes of national education. A democratic system of government has little chance of proving effective unless it rests on an educated electorate. And the development of a national consciousness is the only adequate protection against the dangers of an exaggerated class consciousness, and the still greater danger of selfish individualism.

As yet, the public schools are almost the only department of our educational system in which any definite effort has been made to foster the qualities that make the good citizen. Actual instruction in the rights and duties of a citizen does not, it is true, form part of the public school curriculum; and, though the historical teaching in these schools has been revolutionized in recent years, it still gives inadequate attention to the history of the last century and the significance of the political changes that have transformed the meaning of citizenship. But a public school is almost a state in miniature, and the local patriotism of school life forms an excellent training-ground for the larger patriotism of national service. Our British party system has been saved from degenerating into a mere faction fight by the lessons taught on the football-field and the river, where boys learn to play up for their own side, with due regard for the rules of the game and a proper respect for their opponents.

Many educationists have held that it is impossible to teach citizenship to the children of the elementary schools, and some of the "Readers" provided for the purpose lend support to the opinion. The

syllabus issued by the Board of Education during the presidency of Mr. Acland was a splendid failure because it asked far too much, both of teachers and children.

It is probably impossible to interest children of school age in the problems and methods of government; but it is not impossible to insinuate ideals of citizenship into the organization and curriculum of the school. The writer knows of a school where prefects are chosen every term by a fully-organized general election, with ballot-papers, polling-booths, etc. The older children may be encouraged to form a debating society, in which clear rules must be observed as a protection against chaos. The "Scripture" lesson affords a useful opportunity for showing what true patriotism means, and the history lesson gives a wise teacher openings innumerable. Local events—a municipal election, a Royal visit, a bye-election, a poll on some private bill or adoptive act—can be made an opportunity for eliciting and answering questions. Children may learn thus, almost unconsciously, that the well-being of the community depends on the disinterestedness and public spirit of its members. They should be led to feel that public service is an honourable and worthy thing, not an ignoble scramble for the sweets of office.

Secondary and Continuation Schools. In secondary schools it ought to be possible to connect the historical teaching with some account of our political institutions, if only to correct (without directly contradicting) the inaccurate and one-sided views which sometimes constitute the contribution that home life supplies to political thought. Such lessons must deal with facts, not with opinions; and should be designed to stir the faculty of admiration rather than of criticism. It is not good that children should be encouraged to sit in judgment on their forefathers; where praise cannot be given, silence is often best. The historian need not be a social pathologist; the "soul of divinely suffering man" has never been without its loyalties and ideals, and reverence for what man has done is the only foundation on which we can build hopes of what man may do.

The proper place for definite teaching on the duties and rights of citizenship is in continuation schools. If the school-leaving age is raised to 15, or even 16, it is to be hoped that the additional years will be used, not in adding fresh subjects to the curriculum, but in mitigating the present overpressure by spreading the existing subjects over a longer period. After leaving school, boys and girls will enter the labour market only on condition of having two half days a week free for educational purposes, in addition to any voluntary work that they may do at evening classes of a technical kind. Day Continuation Schools should aim at preparing our young people for domestic and public life. One year, *for both sexes*, should be devoted to hygiene, domestic subjects, the ethics and economics of consumption, and kindred subjects; the other should be devoted to the development of civic virtues. The purpose of the course should be to foster initiative and a sense of personal responsibility. We should teach the duty of national service in its widest significance; we should show how a man may serve the cause of national well-being by a vote as well as by his rifle; we should show how political life may become a noble thing when it serves the cause of the brotherhood of man by recognizing that national resources exist to

minister to the general good. It will be vitally important, in the future, that the general body of electors shall become intelligently interested in the foreign policy of the State; otherwise democratic control may mean immeasurable disaster.

Training Colleges. But such teaching implies rightly-equipped teachers, and the overcrowded curriculum of our training colleges must find room for some teaching on the subject of Politics. For some years, the writer, as Professor of History in Birmingham University, gave a course extending over three terms, on "British Institutions," which was largely attended by students from the Day Training College. The first term was occupied with Central Government; the second with Local Institutions; and the third with Colonial and Imperial Political Problems and Ideals; and an effort was made to deal, in outline, with the historical development of our national political institutions, as well as to explain their present working. Without this historical background, the present constitutional system is not only uninteresting, but unintelligible.

The key to the problem of citizenship teaching is to be found in the training of the teacher. The unrelieved dreariness of many "Citizenship Readers" may foster in children a permanent dislike of the whole subject. As has been already said, direct teaching about systems of government and political machinery might wisely be postponed to a later stage of educational life, but the fundamental principles that underlie good citizenship can be insinuated into the organized life of the school in many ways—by encouraging, under proper safeguards, methods of self-government, similar to those which give its distinctive character to the public school system; by using such organizations as the Boy Scouts, Girl Guides, and Boys' Brigades to foster a combination of initiative and discipline; by inviting essays on some of the simpler social and political problems with which the home surroundings of children bring them into contact. It is perhaps hardly necessary to add that some knowledge of the British Empire, and of the European system in which Great Britain is included, is essential to any intelligent understanding of the meaning of citizenship.

But we must remember that citizenship rests, ultimately, on a moral foundation. Our religious teaching is of little worth unless it fosters the qualities that make a good citizen—imagination, unselfishness, moral initiative, sympathy, sincerity, hatred of injustice, respect for the rights of others. Political life becomes noble and worthy only when it is seen to rest on an ethical foundation. J. H. B. M.

CITIZENSHIP.—(See PATRIOTISM, THE TEACHING OF.)

CITY AND GUILDS OF LONDON INSTITUTE, THE.—Was founded in 1878, incorporated in 1880, and received the grant of a Royal Charter in 1900. It is an association of the Corporation and Livery Companies of the City of London, instituted "for the purposes of all such branches of Science and the Fine Arts as benefit, or are of use to, or may benefit, or be of use to, productive and technical industries especially, and to commerce and industry generally or any branch thereof and for the utilization of such means as will promote the several exclusive purposes aforesaid." The management is vested in the

Members, a Council, and an Executive Committee, composed of representatives appointed by the Corporation and Livery Companies contributing to its funds, namely: The Goldsmiths', Clothworkers', Fishmongers' Mercers', Skinners', Merchant Taylors', Grocers', Salters', Leathersellers', Cordwainers', Saddlers', Armourers' and Brasiers', Ironmongers', Dyers', Pewterers', Vintners', Plaisterers', Cutlers', and the Tallow Chandlers' Companies.

The following is a short summary of the Institute's main operations—

In 1878, before its formal incorporation, technical classes were commenced in Cowper Street, Finsbury, from which grew the present City and Guilds Technical College, Finsbury. This College formed the type upon which technical schools were subsequently established in most of the larger provincial towns. The courses of instruction and the work in the laboratories and workshops are arranged solely with the object of providing a practical, scientific training in those matters which fit a student for a career connected with the industries and professions of Civil, Mechanical, Electrical, and Hydraulic Engineering; Traction; and Applied Chemistry. The chemical department has been recently extended, mainly for the practical investigation of manufacturing processes.

City and Guilds (Engineering) College, The. In 1884, the Institute established a college for advanced technical education at South Kensington, called the Central Technical College. On the reorganization of the University of London in 1889, the College was included, with the consent of the Institute, as a School of the University in the faculty of Engineering; and, in 1907, the Institute adopted a scheme under which it now also forms the Engineering section of the Imperial College under the name of the City and Guilds (Engineering) College; and is conducted by a delegacy representing the Institute, the Imperial College, and the Goldsmiths' Company.

From its inception, the Institute has encouraged the extension of technical education throughout the country and, more recently, in the overseas Dominions. At first, direct assistance was given to many schools which have since come under the direction of local education authorities. Since the establishment of these local authorities, the Institute has co-operated with them in the supervision of technological subjects. Syllabuses of instruction in about eighty subjects are prepared, and examinations held annually at about 500 centres. The subjects include, amongst others, those connected with Building, Engineering, Textile and Chemical industries. For many years the Institute joined with the London School Board in providing, experimentally, classes in manual training and domestic subjects in elementary schools before public funds were permitted to be devoted to these subjects. It established a school of boot and shoe manufacture, now called the Cordwainers' College; and did much to re-establish the art of sculpture on a high level in the country through its Technical Art School in South London.

The Institute is represented on the Senate of the University of London, the Imperial College of Science and Technology, the City Parochial Charities, and a number of other educational foundations and trusts.

The central offices of the Institute are at Gresham College, and its meetings are mostly held in the

halls of the larger City companies. (See also LONDON CITY COMPANIES AND EDUCATION, THE.)

A. L. S.

CITY COMMERCIAL SCHOOL, THE (Pinches' School, Lombard Street).—On the east side of Barclay's Bank, in Lombard Street, a narrow passage, Ball Alley—at its entrance only about 4 ft. wide—wriggles up past an almost disused church and a much used City luncheon house, and reaches the back entrance to 17 Gracechurch Street. Then it turns westward, and comes to an end at George Yard, formerly the inn-yard of the *George and Vulture*, which has stood there since 1600. Just at the westward turn there is a curious low building, which forms part of the Dresdener Bank. This has no entrance from the court; but on this spot, during the first half of last century, there stood an old schoolhouse, much of the same shape, which housed the principal private day school in the City of London. Its great prosperity and usefulness date from 1823, when William Pinches, who had become an assistant-master two years before, took over the management of the school. The resident population of the City was then more than five times as large as it is to-day; the City of London School was talked about, but not actually established until 1837; and the young headmaster, then only 28, soon found his schoolrooms quite full. He was a London man of notable and delightful qualities. A short, stout man; neat and precise in dress and manner and speech; with round, smiling, fresh-coloured face; fair hair, and the kindest blue eyes that twinkled with good temper through his gold-rimmed spectacles. His patience was inexhaustible; he was a strict disciplinarian, and blazed up into righteous anger at any meanness or deceit; but he was just and fair to all, and all his boys loved him.

The fees were six guineas a year; and there were two assistant-masters besides the drawing master and the French master, for whose teaching extra fees were paid. For the teaching of the classics, in which the headmaster himself delighted, there was little room; Greek was not taught at all, but I think there was a little Latin.

Mr. Pinches was a great lover of English literature and the drama, and a fine elocutionist. Much time was given to reading aloud and recitation; and, annually, on the second or third week of December, an elocutionary entertainment was given by the pupils at Sussex Hall, Leadenhall Street.

In 1849, Henry Brodribb, afterwards known as Henry Irving, whose father was in business in Old Broad Street, became a pupil, and soon showed signs of his future greatness as an actor. He recited at the school entertainment in 1850 and 1851. It was in the beginning of 1853 that my two years of pupilage at the school commenced, and I believe I only just missed being his schoolfellow. Sir Walter Wilken, who was Lord Mayor of London in 1895-6, is the only other old pupil of the school of whose subsequent career I have any knowledge.

Mr. William Pinches carried on the school alone until 1855, and was then joined by his third son, Edward Ewin Pinches, who, two years later, became co-principal. But the decrease in the City population was beginning to affect it; and in 1863 the lease expired, and the building in Ball Alley became the *Mocha* tavern. Mr. William Pinches died in 1865; in that year, Edward Pinches married and turned to the profession of the Bar; and the school,

which in 1863 had been moved to 31 Finsbury Square and left to two of the old assistant masters, very soon wasted away.

Two of William Pinches' sons were able and successful schoolmasters: Dr. Conrad Pinches, at Clarendon House, Lambeth Road; and William Pinches, the younger, at St. Martin's Lane, and afterwards at Highgate. Dr. Conrad and Edward Pinches did great service to education at the College of Preceptors and as successive honorary secretaries in London for the Oxford middle-class examinations.

E. CLARKE.

CITY OF LONDON COLLEGE.—(See POLYTECHNICS, THE LONDON.)

CITY OF LONDON SCHOOL.—In 1442, John Carpenter, Town Clerk of the City of London, bequeathed certain estates to the Mayor, commonalty, and citizens for educational purposes. The bequest was utilized in various ways until the year 1837, when, under the authority of an Act of Parliament obtained three years before, the Corporation built a school in Honey Lane Market, Cheapside; the school was removed to the Victoria Embankment in 1883. As might be expected of the officially supported school of so wealthy a city as London, the foundation is richly endowed, and excellently staffed and organized. The fees are moderate, and the subventions of the City Fathers only supplement the many generous benefactions made by, or in memory of, eminent citizens and other public men. Among these sources of revenue may be mentioned funds connected with the names of Sir David Salomons, Sir William Tite, Sir Robert Peel, Sir Albert David Sassoon, Lionel Van Oven, Lionel Rothschild, Rev. E. A. Abbott (formerly Head Master), and H. H. Asquith (Prime Minister). The City Livery Companies are also liberal patrons of the foundation. Upwards of 700 boys are in attendance. There are 14 entrance, 33 internal, and 43 leaving scholarships and exhibitions awarded every year. The School is divided into two sections—Senior and Junior—the former being divided into Classical and Modern sides. There is also a Natural Science side.

The Corporation supports a sister foundation, the City of London School for Girls, situated in Carmelite Street. This corresponds, "as near as may be, to 'The City of London School,' . . . all proper allowance for the difference of the sexes being made," in accordance with the provisions of the will of William Ward, whereby it was founded in the year 1881. Scholarships, of the annual value of more than £250, are awarded as they fall vacant.

CITY OF THE SUN.—(See UTOPIAS, EDUCATIONAL.)

CITY-PLANNING IN ITS EDUCATIONAL ASPECTS.—For this subject, as for so many others, it is well to observe the ways of children in freedom. Watch them on the sands, busy digging and building: this unconscious practical examination proves their varied imitativeness and originality, and thus at every age and stage. Their growing powers are also illustrated as their constructions grow from the rudest hills and mounds to regular camps and fortresses, or thence to mermaid pools and fairy gardens. Teacher and parent may here take part, first in humble employments, befitting to their superior strength and weaker imaginations, and therefrom rejuvenate, until with reviving fancy

their wider knowledge finds new openings, or they produce work of greater skill or finer finish. In such co-operations of young and old, the human progress of ages may be epitomized between tides. Houses and hamlets are built, and grow to villages; and these to towns with streets and palaces, with walls and towers and gates. With rocks rising through the sand for our mountains and hills, we may enter on new labours, more beautiful, and a tide or two more enduring, than on the wave-swept levels. With a little practice, one learns to build upon irregular or sea-broken rocks great complex sand-castles, which yield sketches and photographs not only of romantic charm, but almost of convincing reality. The kindergarten and playground sand-heap may similarly be employed, especially where rock-work may be brought in.

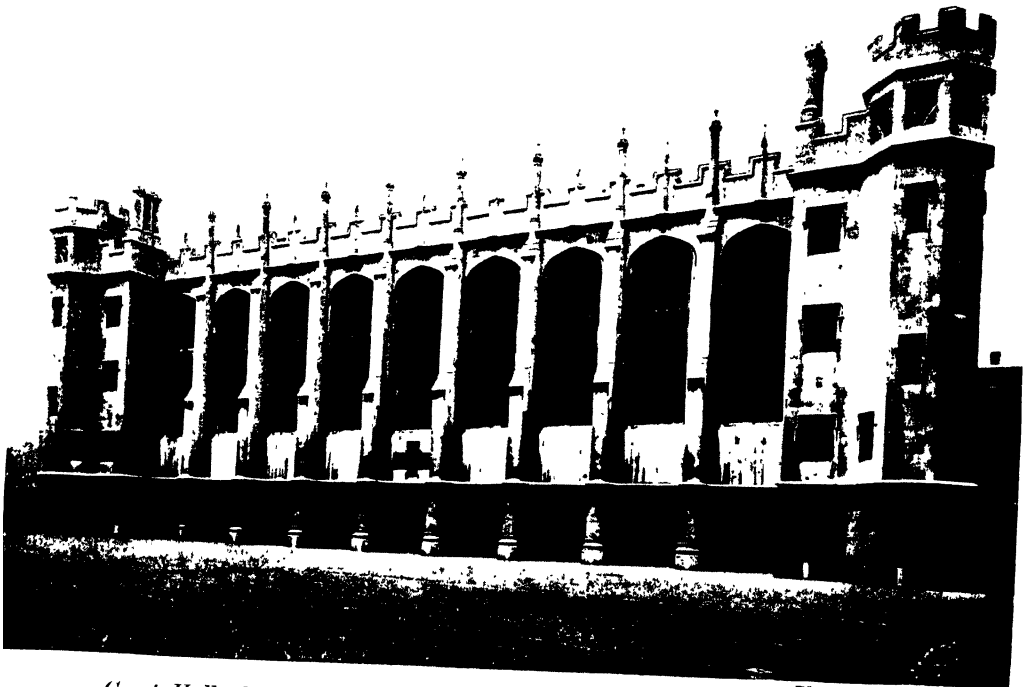
Toys. So, at home, the small boy playing at soldiers and with guns has long built forts for them as he now digs trenches; and for his ironclads he must have ports, and these their towns. Girls and boys in the country love to make farmyards and villages; they plant trees and lay out gardens; and, if the smallest stream is available, a millpond and mill soon follow. Hence the Russian or Tyrolean peasant has made such toys for his children long before they came into commerce. Such toys have been taking, of late years, noteworthy developments, so that the kindergarten storeroom may readily bring together a collection ranging from the simplest Russian village to the sacred pilgrimage city. The *Studio* has been showing for years past how architect and artist begin to aid and direct the toy-maker, as so notably in Vienna; and a vital age for these resources of child-life seems again at hand. Yet there is a danger of over-elaborating toys in lessons; and the best of such domestic and constructive toys will always be those which do not lose touch with the child's experience, and which start with the best in his own country or town. Thus, among artists, Godfrey Blount, of Haslemere, has well met the situation of English children.

From Shop to City. Among town children without guidance—country ones, too—their imitative and constructive instincts set them to making shops, often with elaborate variety of wares, represented by sticks and leaves, by stones and broken pottery, if nothing else be to hand. Here, too, the friendly teacher and parent may lend a hand, and, after winning confidence as an appreciative customer, may be admitted to a share in the business. The shops may thus be extended to a whole row, a street, a market-place. To this beginning and centre of the town, extensions will suggest themselves for work and life, and of many kinds. Public buildings will gradually suggest themselves to the children, without undue helping forward; the school and church, perhaps, for choice; but likewise the post office, the railway station, the town-hall, and so on. At first, of course, these are set down in any position; but gradually emerges the sense of order and the desire for improvement. For one child this will lie primarily in regularity, for another in convenience, for another in greater magnitude, or added beauty; among all there gradually and naturally arises the sense of the multifarious yet rational requirements of civilized life in the town. Gardens will soon be wanted, and made with varied care; playgrounds will be marked out, and parks will be planned conveniently where some existing tree or bush affords the suggestion young imagination loves. Fresh suggestions come in: for one, from some



Christ's Hospital, West Horsham, The Quad

Photo by F. Frith & Co.



Great Hall, Christ's Hospital, London (the G.P.O. now stands on the site)

Photo by F. Frith & Co.

town he has seen ; for another, something seen in a picture book, heard of, or read about. Geography and history thus enter the field of interest, and this in true spontaneous fashion, not by the didactic dictation, which defeats itself by turning play into lesson instead of lesson into play. The homely market-place may be developed, say, into that of Bruges, with its great belfry. Longfellow's well-known verse may thus win its place in the child's anthology of memory : or, similarly, with every historic town. The building bricks, which are so desirable to every school (as well as nursery) outfit, thus gain redoubled interest and value. For, as in every age, it takes large purposes—temporal or spiritual—to erect any considerable and significant building, so on the child's plane also : he can only build when he wants to build, and knows what he wants when he sees use and finds place together.

Materials. With good store and choice of bricks, much may be done. The completer sets, with columns, pediments, etc., may also come in (not too early) ; notions of architecture proper may thus be brought in, and classic towns thus presented—in fact, more easily than are romantic ones. Still, with due respect alike to building bricks and to architecture, the larger view of towns is more attractive, more educative to the child, and far more within the scope of most teachers to develop. To make whole houses of stiff paper and cardboard, of old matchboxes or of wood, and to colour these effectively, is good handicraft exercise ; while all should be kept on scale sufficiently small to admit of extensive civic constructions and of rearrangements as required. Art school and workshop thus alike come in to help.

Historic Reconstructions. Beyond the fitful demolitions of unguided childhood (so often carried out through history, as to-day, by children of larger growth), and after the criticism which arises when the mischief is done, there appear more constructive purposes, with changes justifiable on rational grounds. The greatly educative conception of city development thus gradually appears ; again, as in the historic past, from market-place to "Grand Place"—from Agora to Forum. On the site of the Roman basilica will appear the church ; by-and-by, the cathedral ; and so on : the growth and change of our toy cities thus passing on into the great game the Muse of History has played with the world. So all historic cities : Jerusalem, Athens, Rome, may all be set out upon their modelled hills ; and when their essential phases are expressed, their stories may be told with a new vividness, stimulating alike to teacher and taught in fruitful interaction. Plans of such cities at various periods are easily obtainable, and model towns more and more effective may be made. Solomon will thus again build his Temple ; and Ezra and Nehemiah, in a later age, restore the broken walls of the Holy City. The Acropolis may be destroyed by the Persians, and the Parthenon more worthily built, the theatre of Dionysos next modelled, and the like ; or, conspicuously for Rome, from earliest round huts to Augustan and later monuments. Even destruction may be made vivid with historic record ; but reconstruction yet more, and this throughout history, up to St. Mark's Tower in Venice, as by-and-by for Louvain and Ypres.

Connection with Other Subjects. So with school-gardening—from homeliest to highest—seed-plot and salad-patch of cottage to historic and modern

magnificence, and beyond this to future palaces of art ; beyond these again to the gardens of mythology, poetry, and of romance—those of Olympians and Muses, of saints and heroes.

In such ways, then, developments arise at all stages, and for pupil and teacher alike. In one schoolroom or playground or garden, village and town-planning will evolve into or meet and develop the "geography garden," of which a notable example has long been in progress at the Wakefield Girls' School. One school will thus work up its sacred or its classical history, and another its modern. One guild of builders may evolve a stately presentment of some great city, another specialize upon its own borough. In every case, appropriate plans, pictures, and photographs, prints and post cards may be gathered, and these may stimulate others (as so notably with Mr. Valentine Bell's teaching in Lambeth) or even, as at Saffron Walden Training College, co-operate with the local museum for the production of a noteworthy historic and comparative gallery, which interests the town and spreads to others. These again co-operate with the Cities and Town-Planning Exhibition upon its world-wide wanderings, and with the civic and regional surveys now spreading from Edinburgh, Dublin, and London, as throughout so many cities of the United States.

Yet another starting point is afforded by mechanical toys, especially those of engineering character. Toy railways and stations are in every toyshop, and variants may be made : docks may be constructed for our toy ships, and, beside all these, towns again. Garden suburbs will thus be seen as rational needs, not distant Utopias, and with useful reaction from school on homes. It is not too much to say that through this game of town-planning—leading on, as it does, to geography, history, literature, city design—are already being made great and needed contributions to education and to citizenship ; and these, at every level, by kindergarten and school, by training college and university.

The co-operation of such town survey and city planning, with the yet more active and educative, because even more evocative, discipline of pageantry and masque (see PAGEANTS AND MASQUES), is obvious. This correlation of historic, actual, and possible environment, with the corresponding history and civic life, richly rewards all who enter upon its simple and natural beginnings. Nowhere more may pupils and teachers progress together—from homely constructiveness to highest efforts—and to dreams beyond these.

P. GEDDES.

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CIVIC UNIVERSITY, THE.—In Britain, where voluntary effort is still the mainspring of progress, universities have of late rapidly multiplied by local effort, particularly in the large industrial cities of England. The University of Wales, very similar in scope and organization to the former Federal University of the North of England, has, owing to the fact that two of its colleges are situated in small towns, assumed a national rather than a local character. In Scotland, where the love of learning has been more widely diffused in the community than in England, the old-established universities

have always drawn students from far beyond the civic boundaries. Ireland presents its own problems in university education as in other matters. The newer universities of industrial England, closely identified as they are with the educational interests of their respective cities, have for that reason often been called "Civic Universities"; but, only as providing the highest type of education in the district, and, as it were, forming the keystone of the education facilities of the city, can these universities be considered as civic institutions. They are not limited in their scope to studies of direct interest or importance to the citizens of the locality; they are not governed by, nor do they necessarily reflect, the educational ideals of the local education authority. Sometimes the name "Provincial Universities" has been given to them in distinction to the University of London, which has never been a purely local institution, but serves as an Examining University for the whole of the United Kingdom, if not for the Empire itself. Even now, when it has become the teaching University for London, it still keeps its examinations open to all comers. The term "civic" is, on the whole, preferable to "provincial" as descriptive of the universities of our large industrial towns, for, apart from the somewhat slighting interpretation which is often attached to the word "provincial," the older universities of Oxford and Cambridge might be taken to be included in the term provincial universities. These latter differ widely, however, from the younger universities, and will long continue to be regarded as more national in scope and interests. The nearest counterparts to these British civic universities are probably those which have been founded by endowment in large American cities such as New York and Chicago; and it is of interest to remember that, in spite of the already numerous universities in Germany, most of which are situated in small towns such as Jena, Göttingen, Heidelberg, etc., two, at any rate, of the larger industrial towns—Frankfurt and Hamburg—were, before the war, agitating for universities which would probably be more directly civic institutions than are those of the Midlands and the North of England.

Scope and Nature of Activities. Though our younger universities are in many ways closely associated with the cities in which they have been started, it would have been unfortunate had they aimed at meeting purely the local educational needs. There should be nothing narrow or provincial about them; but the more complete the provision they make for the highest forms of learning, the more fit are they to be regarded as the keystone of the educational edifice of the towns which they primarily serve. In that sense they become civic institutions, and as such it is to be hoped that the cities will take an ever-increasing interest in them; while it is certain that, if they receive adequate financial support from the municipal authorities, they will be better able to serve the needs of the district, and they will gain in strength and usefulness by a closer association with the intellectual life of the community. Most of the civic universities owe their foundation, and many of them their continued existence and development, to the munificence of enlightened citizens, who took a very wide view of what constituted a liberal education, and by no means wished to make the college or university which they endowed a mere training school for the learned

professions. In that capacity, it is true, they can be of great use to the district in which they are situated. Parents who desire their children to enter the medical, legal, or teaching professions can obtain the necessary training for them without sending their sons or daughters from home and incurring the heavy expenses of education at the older universities. Moreover, in the case of the medical training, the facilities for clinical work offered by the large hospitals of big towns are of the best, and throughout his training the medical student comes under the influence of the most eminent practitioners and consultants. Similar advantages are gained by law students in a great city, and the same is equally true of students in the faculties of Education and Theology. In the departments of science such as Chemistry and Engineering, the large works and workshops of an industrial centre offer great facilities to students to become acquainted with the practical bearing of their studies before they enter the industries to which most of them intend to devote their lives. But if the position of the civic university in a centre of industry has advantages for students in many of its departments, it is equally true that the university may become for the community in which it is situated a centre of intellectual stimulus and of real help. It has become in some localities the meeting place for various professional and technical societies, and special courses of lectures have been organized for members of various industrial associations. But most of all, members of civic universities have undertaken, in many instances, to forward the interests of local industries, endeavouring to solve some of the problems which perplex the manufacturer. More and more frequently the advice of the scientific expert is being sought by the practical man, and nothing but good can come of such collaboration. A faculty of commerce is no longer a novelty in our universities, and students who have received in it thorough instruction in Economics, in Commercial Law, Accountancy, Modern Languages, and Geography, have not only proved themselves to be capable of successfully undertaking heavy business responsibilities, but have brought to bear upon commercial problems a wide outlook and sound judgment. It is important, however, that the universities should not have a narrow outlook even in dealing with those branches of their work which are more directly concerned in training men and women for service to the community. Some of this work may lie outside the boundary of the municipality in which the university is situated, and yet be of vital interest to the welfare of its citizens. This, for example, is the case of Agriculture, the earliest and still the greatest of all industries. Particularly of recent years, since the Board of Agriculture has recognized provincial centres for higher education in Agriculture, the universities situated in these centres have taken up the scientific and, to some extent, the practical study of this branch of applied science. It is important that in the more recent development of the civic universities, the ideals of their founders should not be lost sight of, and that the rapid growth of professional and technical departments should not be allowed to overshadow the earlier studies, which, laying as they do the foundations of human culture, are not less important to the community than the professional training of its citizens. It is, perhaps, a pity that the haste to complete a professional training, or the time required for it, prevents most

students from taking a degree in Arts or pure Science before proceeding to professional studies, but it is all the more gratifying to know that the Classics, Modern Languages, and History have not only shown no tendency to disappear from the curriculum, but in some of our universities which are the best equipped for Science, the Arts Faculty has continued to grow and to expand. This is probably largely due to the fact that strong departments, both in Arts and Science, have not confined themselves to giving excellent instruction in their respective subjects, but have continuously upheld the university tradition that it is as important to extend human knowledge as to hand on what is known. Wherever this equally important function of university teachers has been vividly realized, departments have gathered together distinguished investigators, and both staff and students have kept alive that spirit of research which is, or should be, the life-breath of all universities.

How the Non-residence Difficulty is Met. While, as we have seen, advantages attach to certain departments of the civic university by reason of its close association with a large community, its non-residential character is often regarded as its great drawback. Undoubtedly it is a disadvantage that many students, more particularly those residing in neighbouring towns, take little part in the college life of the student outside the class-room or laboratory. But this does not apply to all, and need not apply to any students. Halls of residence, such as exist in the larger of the civic universities, give ample opportunities for that close intercourse and social life which is so important in the building up of friendships and of character; and, in the case of students living at home, the Students' Unions, the Athletic, Debating, and other societies afford plenty of scope for students to mix freely and to cultivate a genuine *esprit de corps*. They also form a common meeting-ground for staff and students, and, as such, are of the greatest benefit to both pupil and teacher. The movement which has begun at several of these universities to definitely train men and women for social work may not only foster the spirit of social service, but will also provide more useful helpers. The civic university should set out not only to train professional men and women, but should aim at producing useful citizens, and it is to be hoped that Social Science will always be one of the fields of work in which students will either engage as volunteers, or for which they will prepare themselves. Another activity in which both the older and the civic universities are equally engaged, but which it is more incumbent on the universities situated in the more populated districts to foster, is the development of courses of instruction in collaboration with the Workers' Educational Association (*q.v.*). It is right that the industrial worker should feel that the university exists for him, too; and, if he cannot give that full measure of time which the more fortunate undergraduate is able to do, he should at least have the opportunity of undertaking systematic courses of study, if he is prepared to give substantial and continuous attendance to such courses. It is to be hoped that when the local education authorities have realized as fully as the Board of Education has done the inestimable advantage of a really well-educated working class, and are prepared to find adequate financial support for tutorial and other classes for the workers of the district, this branch will not represent so small a portion of the energies

of our civic universities as is at present the case. Close as is already, in most cases, the connection between the civic universities and the cities in which they are situated, it is probable that more and more citizens will, in the future, avail themselves of the facilities for higher education which are now at their doors; and the interests of the town and the University will thus become more closely interwoven, so that the work of the civic university will be in every sense an integral part of the life of the city. F. E. W.

¶ **CIVICS, THE TEACHING OF.**—(See CITIZENSHIP, THE TEACHING OF.)

CIVIL ENGINEERING, THE TEACHING OF.—

The expression "Civil Engineering" embraces all branches of engineering as distinguished from military engineering, which, as the older branch of the profession, has hitherto been regarded as a distinct branch. The making of this distinction less sharp in future is likely to be one effect of the Great War, for it is clear, from the experience so gained, that future wars will be fought not only with armies and navies, but with the whole of the industrial resources of the nations involved. As these are so dependent on engineering efforts, it is becoming more and more obvious that a country which is a first-class Power can only hope to remain such in future if its engineering talent is so trained and organized as to be able, at short notice, to become part of the military machine of the country. Possibly such a result could best be effected if the training of every civil engineer included, at all events a partial training in military engineering also. Some confusion arises in the minds of those unacquainted with the engineering profession, owing to the fact that the term "engineer" is used in a popular sense to signify artisans—such as turners, fitters, engine-drivers, etc., as well as in its more correct sense, to designate members of the civil engineering profession. The distinction is so obvious as not to cause any difficulty—except, to some extent to the uninitiated, as regards preparation and training for engineering as a profession. As all branches of the civil engineering profession are founded upon the application of the teaching of natural philosophy to the use and convenience of man, it follows that a sound training for any branch of engineering should follow more or less the same lines up to a certain point, after which, owing to the multifarious ramifications and the extraordinary developments of engineering practice, specialization becomes imperative.

Civil engineering has both a theoretical or scientific, and a practical or constructive, side; and it is essential that the training for it should be efficient from both these aspects. The theoretical and practical training, to be most effective, should be interwoven, as a thorough appreciation of either of these aspects cannot be brought about without the help of the other. The two are thus complementary to each other, and both are indispensable. A youth desiring to enter the engineering profession should be given a sound and liberal education at school, including language and literature, drawing, mathematics, and elementary science. The question, then, has to be settled as to how the necessary theoretical and practical training can be obtained as concurrently as possible. This training may be divided into three parts—really separate, but for

the best results they should be interwoven with each other—

1. Preliminary workshop experience, when that can be arranged.

2. Theoretical training, to be acquired preferably at a university or technical college.

3. Training in the art of the particular branch of the profession finally chosen.

Preliminary Workshop Practice. In order that the candidate may have some definite ideas as to the application of the knowledge he will acquire in his studies, it is desirable that he should, at an early stage, acquire some experience of workshop methods, which will incidentally teach him not to leave out of account the economic and human elements which play so important a part in engineering questions.

Many colleges are provided with workshops, where the students are taught elementary workshop practice, and to operate the more usual types of machinery used in engineering workshops. Although these are useful in their way, they cannot reproduce the economic considerations and the labour problems which arise in an actual engineering works. It is therefore desirable at an early stage—say, on leaving school—that the engineering tyro should spend about a year in an engineering works and familiarize himself with the mechanical construction which is involved in the modern use of machinery in every branch of engineering work.

Theoretical Training. He should be careful during such training to keep fresh in his memory such subjects as geometrical drawing and mathematics, in which he will have obtained a certain amount of proficiency at school. This can be done either by attending evening classes or by private study. Unless he has, before leaving school, passed an examination which the Institution of Civil Engineers accept as exempting from their examination for the admission of students, an excellent incentive to such study is provided by entering for the studentship examination of this Institution. (See INSTITUTION OF CIVIL ENGINEERS.) One of the privileges of students of the Institution is that they are allowed to sit for the examination for Associate membership of the Institution at the most convenient time to themselves, which is usually at the time of leaving college, instead of having to wait until old enough to be elected an Associate member. It should be observed, however, that certain university degrees are accepted by the Institution in lieu of their own examination, so far as regards the scientific subjects which can be acquired at college. As corporate membership of the Institution is of itself an evidence that a young engineer has received a suitable engineering training, failure to be elected Associate member is a handicap which should be provided against. This represents the theoretical part of the training, and can be most effectively acquired at a university or technical college which provides an engineering course, and is furnished with suitable laboratories.

The Scottish universities provide facilities for interweaving the three portions of the training by dividing the course of instruction into winter sessions (each six months long), leaving the summer available for practical training. This makes it more difficult to arrange for the pupillage or apprenticeship necessary for the professional part of the training referred to below; but, if this difficulty can be overcome, it results in a saving in the time

of training, compared with taking the professional part of the theoretical training.

Specialization. Up to this point there is no particular object in varying the training, whatever branch of the profession the student ultimately takes up; but at this stage the time has arrived for him to specialize, and he should make up his mind what particular branch of engineering he proposes to follow. This choice should be governed by his special aptitude and personal preferences, and also by the opportunities which present themselves for securing a pupillage or apprenticeship to an engineer or firm practising in a particular branch of engineering. This is a far more satisfactory plan, if conscientiously followed, than attempting, at this stage, to obtain a position as improver or assistant. For, in the latter case, the student would not be likely to have an opportunity of obtaining experience in all or many of the branches of the work (e.g. in the drawing office and in the field or works, as the case may be); whereas in the case of apprenticeship, such opportunities are one of the considerations for which the fees are paid, and it would be the apprentice's own fault if he failed to avail himself of the advantages thus offered. He must understand that his object should be to learn the processes carried out, and the organization and management of the labour employed, more than to become expert as a craftsman in any particular department. During such practical training in the art of his profession, the young engineer should continue his theoretical studies in the particular branch he is then engaged in. Even after this period is over, he can by no means consider that his theoretical training is completed, for it will be necessary to follow the fresh developments as they occur, by the help of the papers read and discussed at the Institution of Civil Engineers, and at other institutions which devote themselves to the special branch of engineering he has selected. He may also be greatly helped by the technical papers and new books on the subject. A.W.B.

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CLARENDON PRESS.—This is the original publishing department of the University of Oxford, and has been known since 1830 as the Oxford University Press. It was founded in 1672 on funds provided by Lord Clarendon's *History of the Great Rebellion*, which it published and of which it afterwards held the copyright. At first it was placed in the Sheldonian Theatre; and the present premises are in Walton Street, Oxford. By an Act of Parliament passed in 1775, the Clarendon Press has a perpetual copyright of all books belonging to it, and printed and published by it. This copyright includes the production of Bibles (Authorized Version), of which it has the sole right by royal patent.

CLARK UNIVERSITY.—(See UNITED STATES, COLLEGES AND UNIVERSITIES OF THE.)

CLARKE, JOHN.—Head master of Lincoln Grammar School in the first half of the seventeenth century, and author of several school books on the teaching and discipline of grammar schools. In his *Phraseologia Puerilis* (1638) he advocated the teaching of pure and elegant English, and in 1639 he published a collection of English and

Latin proverbs collected from many and varied sources. He also wrote religious books, and a book of instruction on schoolboy manners and morals.

CLARKE, JOHN (1687-1734).—A classical scholar who became head master of Hull Grammar School in 1720, and afterwards of Gloucester Grammar School, where he died in 1734. He wrote numerous educational works, including *An Essay on the Education of Youth in Grammar Schools*, in which he criticized current methods of teaching and proposed new ones. He also made many translations of classical authors, and wrote an *Essay on Study*, giving directions for the collection and management of a library.

CLASS MANAGEMENT.—(See **MANAGEMENT, CLASS.**)

CLASS, THE PSYCHOLOGY OF THE.—The older psychologists devoted themselves to the study of the individual, and to the mature individual at that. Recent developments have led to an investigation of the effects produced upon the individual by his intercourse with his fellows. Among the many "selves" recognized by modern psychologists is the "social self," and by the very use of this term they admit the need for a special study of the interaction among egos. From this study has arisen what is sometimes called collective psychology, a science that treats of the nature of man as it is manifested in his relations with his fellows. Its subject is human nature dealt with in bulk.

Experience shows that man's conduct varies according to the person or persons in whose presence he is acting. His nature appears to change according to his social environment. He varies according as we find him at home or abroad, in church or in the market-place. Carrying the matter farther, we are not surprised to find that a man in a crowd will often act in a way that astonishes those who have only known him in his ordinary social reactions. Consequently, the study of crowd activity becomes of importance to all of us, but particularly to those of us who have to deal with humanity in the mass, as is the case with the teacher.

The beginnings of collective psychology are not to be found in the direct study of the crowd. Plato and Aristotle touched the fringe of the subject in their treatment of the relations between the individual and the State. But it is probable that to Walter Bagehot belongs the credit of initiating an investigation into the direct mechanism of the interaction between the individual and the social group in which he finds himself. His *Physics and Politics* marks the beginning of the detailed analysis that lies at the bottom of collective psychology. In his monumental *Les Lois de l'Imitation*, G. Tarde elaborates the principles that underlie the interactions of social units. Mark Baldwin carries the analysis still further; and in his popular little book, *The Psychology of the Crowd*, Gustave le Bon supplies a presentation that is particularly useful to the teacher, since it definitely introduces a collective unit.

We have to realize that this unit, whether we call it the crowd, the mob, or the class, is something quite different from the elements that make it up. It is very natural to regard the crowd as a mere sum of its constituents. We are apt to think, for example, that we can get a knowledge of the nature

of a crowd by the simple process of summing up the qualities of the members of the crowd, and then finding the average. Teachers are, perhaps, specially liable to this fallacy of the average. They have a way of talking about the average pupil as being the sort of person they must keep in view in preparing a lesson; and so long as we confine ourselves to matters of mere instruction, no great harm is done. But as soon as we begin to deal with a group as a psychological unit, we must give up all idea of working by averages. Such a unit differs qualitatively from the elements of which it is made up, and therefore cannot be treated by merely quantitative methods. A group of people gathered together is not necessarily a crowd in the sense of forming a psychological unit. There is no better way of making the point clear than by a comparison between a mechanical mixture and a chemical compound. In the mixture, the individual elements always remain distinct from, and independent of, each other; in the chemical compound, they are so united as to become a new whole. A mixture of pepper, salt, and sand becomes a greyish powder in which each of the constituents remains distinct and unchanged, and can be separated out. A chemical compound of a colourless gas (oxygen) and a silvery metal (mercury) becomes not a silvery gas or a colourless metal, but something totally unlike both constituents—a bright red powder. The crowd as a psychological unit is something quite different from the mere group of persons of which it is formed. There must be a common interest before a group of persons, however numerous it may be, can be welded into a whole. All the elements of human nature necessary to produce a strong collective activity are no doubt present, but there is need of some force to set them in motion.

The Influence of Imitation. If it is asked why it is that in a crowd individuals will act in a way they would never dream of doing if they were alone or among their ordinary associates, the answer usually given is that the driving force is imitation, which is universally recognized as one of our fundamental instincts. But this explanation is not in itself sufficient. The respectable elderly gentleman on his way home from business can watch with impunity an excited individual shouting and throwing his hat in the air. Here there is a model, but the imitative instinct remains dormant. Yet in a crowd the respectable gentleman has been known to yield to imitation, and send his hat flying with the rest. The model apparently must be supplied on a sufficiently wide scale to produce an effective response. The truth is that the mere effect of numbers, when dominated by a common interest, exercises a positive influence which the individual cannot resist, even though the action imitated is against all his usual habits and prejudices. It does not make matters much clearer to speak of this compelling force as *herd instinct*. We want to know how it is that the members of a collective psychological unit are reduced to a common level. It probably comes about in some such way as this.

In a crowd, all the psychological elements that are present in every individual react upon each other in such a way as to strengthen their force. In collective activity, the universal elements of human nature, as found in each person, fuse with those found in all the others. On the other hand, all the peculiarities of each individual are opposed

by the peculiarities of the other members of the crowd. The result is a process of struggle which ends in the arrest of the activities that might be originated by those peculiarities. By this process of fusion and arrest, individual idiosyncrasies, whether natural or acquired, lose their effectiveness, while the great elemental forces are intensified.

The Application of Crowd Psychology to Teaching.

From the crowd, the teacher has much to learn. It is true that crowd reactions are usually much more vehement than anything that occurs in school. But the same influences are at work in the class, and in what is called a crowd or mob. Crowds are sometimes divided into the two kinds, homogeneous and heterogeneous; and it is quite reasonable to describe a school class as a homogeneous crowd. Indeed, it would be difficult to find a better example of this kind of collective unit. The pupils are of approximately the same age; they belong to the same class of the community; they live in the same district; they are subject to the same social and political influences; from the very nature of the case, their academic attainments are practically identical. A school class may, therefore, be reasonably regarded as a special kind of crowd and treated accordingly.

This matter of treatment does, however, differentiate the class from the crowd as ordinarily conceived. As a rule, a crowd is regarded as autonomous. It is not something to be managed from without. No doubt, history supplies cases in which crowds have been deliberately manipulated by political adventurers; but, generally speaking, the crowd is regarded rather in the light of one of the manifestations of Nature—a sort of blind force. It is true that there is always some sort of leadership in crowd activity; but the leadership generally comes from within, not from without. In the class, it is the other way about. Mob leaders are of the crowd as well as in it. The teacher, on the contrary, always stands outside the class, and regards himself as something apart from it. He plays upon the class as upon an instrument. It has to be noted that in the class, as in the heterogeneous crowd, there are usually class leaders, and of these the teacher must take account. But they are instruments by means of which the teacher manipulates the class, rather than independent forces directing the class on their own account. It occasionally comes to pass that certain of the pupils do come to regard themselves as specifically class leaders, but wherever this takes place we have something abnormal. Such leaders become, by the very fact of their awareness of their rôle, rivals to the teacher. The difficulty does not, as a rule, arise except in dealing with advanced classes, and in their case a safety valve is offered by the system of prefects or monitors. These officials hold an intermediate position between internal and external class-leaders. They are of the class, and on certain occasions are merged into it.

Just as it is dangerous to allow members of the class to exercise conscious control over their fellows without the express delegation of authority by the teacher, so it is undesirable that the teacher should, except on rare occasions, abdicate his external authority and become a mere class leader from within. Some teachers rather like the idea of "losing themselves in their class," but all that they aim at can be attained by avoiding laying emphasis on the fact of external authority. If the teacher could really lose himself in his class, it

would become a genuine crowd and forfeit its distinctive features as a class.

If imitation be the driving power of crowd activity, suggestion is the force that guides imitation. A psychological crowd is always in a highly suggestible state. It is for this reason that it is so much in the hands of its more or less deliberate leaders. It is, further, by the use of suggestion that the teacher can manipulate his class with the minimum display of authority.

The Nature of the Class. In order to get at the real nature of the school class, it is well to remember that it owes its origin to economic considerations. It is an obvious way of communicating knowledge at the least cost. In the first instance, the class existed for the sake of enabling society to spread information. Its aim was instruction rather than training. While the wealthy were able to provide private tutors for their children, ordinary people had to combine in order to get for theirs the advantage of instruction from competent teachers. The gathering of crowds of students at the feet of the professors at the ancient universities strengthened the system of class teaching. But underlying all this was the idea that the class was a compromise between personal instruction by a highly-qualified private coach and no instruction at all. The justifications offered for the huge classes of the monitorial system emphasize this point of view. It was all a matter of how many pupils a master could *teach*. It is not often realized that when we consider education in its wider aspect, as apart from, and yet including, mere instruction, the class may have a positive value in itself. The training the pupils get by the interaction with their fellow-pupils in class counts for much. Class control can be so exercised as either to repress or to develop the individuality of the pupils. Some of the teachers who during the last century elaborated the class system in elementary schools quite realized the value of the collective or class feeling and its effects on the pupils. When they spoke of that mysterious force that they called "the sympathy of numbers," they indicated their recognition of the possibilities of collective psychology. David Stow, in the development of his Training System, laid great stress on this collective sympathy, though he left its analysis to those who were to follow him.

Mr. William Macdougall, in his *Social Psychology*, has set forth a scheme which provides a very promising basis for further investigation into the interaction of individuals in a social group. Basing on the fundamental instincts and their corresponding emotions, and using A. F. Shand's theory of the sentiments, he provides a sort of atomic table which may be used in the building up of binary and ternary compounds which future writers will no doubt so manipulate as to produce a working guide to the class teacher. In the meantime, we have only the rudiments of a science that has yet to be developed.

Many teachers do not realize that in ordinary school work it is not possible to keep a class continuously at the level of a psychological unit. Before a lesson begins, a class is not usually a collective unit at all: it is a mere group of individuals at the mechanical mixture stage. At the end of the lesson it drops back to the same state, and too frequently at various points during the lesson there is a falling away from the collective unity that real class teaching demands. To be sure, the

interest of the lesson is not the only force that can maintain the class as a collective unit. A rebellious class may maintain its unity by the force of the hostile reaction against the teacher. In unwholesome conditions of discipline, the class may have given up all intellectual work and yet be so intensely alive as a corporate body that it deserves to be described as being "in an electrical state."

But in normal healthy class work there are periods when the collective feeling is deliberately dispelled. There is such a thing as a useful, and, indeed, necessary, breach in the collective unity. Occasions frequently arise when the teacher deliberately breaks up the psychological unity and reduces his class to a mere group of individuals, each doing a separate piece of work. A problem is set, for example. In the stating of the terms to the class, the teacher is dealing with his pupils as a unity. So soon as they are set to work out the problem, the class as a unit has disappeared, and has resolved itself into a group of individual investigators. When the teacher by-and-by goes to the blackboard to gather up the results of the work done, and to explain difficulties that have arisen, he has to treat the class again as a whole. This alternation between disintegration and reintegration ought to mark the class work of every school, but the alternation ought always to follow the will of the teacher. It is the business of every teacher to prevent the class ever, except at his desire, slipping out of the status of a collective unit. Even the best of teachers will find now and again that disintegration has set in without his will, but every such case he must regard as one of his failures.

J. ADAMS.

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CLASSES, THE SIZE OF.—The progress of our educational and scholastic theory has gone forward in the direction of smaller and smaller classes in the primary school. In early days, large classes seemed reasonable: youngsters were thought capable of teaching their fifties and adults their hundreds. A serious discipline of character was hardly attempted, nor instruction in any variety of subjects. Under the superintendence of the head of the school, boys in their early 'teens could have charge of a couple of score during the '70's and early '80's of the last century—the Education Department required a pupil-teacher for each forty after the first sixty children in average attendance. In this respect, our days are more righteous and more reasonable. Then, a school of one hundred could be run by a principal teacher¹ and a child of 13, with none to make them afraid; now, a principal and a trained and certificated assistant may not do it. In the calculation of a staff beneath which official rebuke might be expected, with possible loss of a portion of the Government grant, the principal teacher counted

for 60 children in average attendance, the pupil-teacher (in apprenticeship) for 40, and an assistant teacher—successfully out of apprenticeship—for 80. The Code of Regulations as issued from year to year governs this sort of thing, and the departmental standard has improved progressively. For many years the number for the principal teacher was 60: it is now 35. The number for the certificated assistant passed from 80 to 70, and is now 60; that for the uncertificated assistant from 80 to 70 and 60, and is now 35. A woman over eighteen years of age, but with no scholastic credential, could take 40, then 30, and now—with stringent limitations of appointment—20. The pupil-teacher—or the bursar, who has very generally taken his place—can take but 20. All these numbers are for a preliminary calculation and in average attendance: the circumstances of a school may require a more liberal staff, and no teacher may have more than 60 on his register. (See CODES of successive years.)

Departmental control of secondary education is modern (see EDUCATION ACT OF 1902, THE), and here the Board of Education makes a definite limitation: the number of pupils taught together at one time must not, as a rule, exceed 30, and must never exceed 35 ("Regulations for Secondary Schools").

A. E. L.

CLASS TEACHER.—(See ASSISTANT TEACHER [CERTIFICATED])

CLASS TEACHERS, THE NATIONAL FEDERATION OF.—(See NATIONAL FEDERATION OF CLASS TEACHERS, THE.)

CLASSICAL LEARNING AND CRITICISM.—The modern development of classical learning and criticism falls into four principal periods: (1) the Italian; (2) the French; (3) the English and Dutch; and (4) the German, during which classical scholarship has become more and more international in its character.

1. **Italian Period.** The Italian Period corresponds to the age of the Revival of Learning in Italy. It includes the two centuries from the death of Dante in 1321 to the death of Leo X in 1521, and it closes with the Sack of Rome in 1527. It is the age of the Italian humanists, and its primary aim is the *imitation* and reproduction of classical models of style and of life. It is also marked by the quest for manuscripts of the Latin and Greek Classics. Among those who took part in that quest were Petrarch (1304–1374), who found two of Cicero's speeches at Liège in 1333, and his *Letters to Atticus* at Verona in 1345; Boccaccio (1313–1375), who discovered the *Ibis* of Ovid, with Martial, Ausonius, the *Appendix Vergiliana*, and, possibly, one of the two Medicean manuscripts of Tacitus; and Poggio Bracciolini (1380–1459), who, in 1414–1418, found many important MSS., including hitherto unknown speeches of Cicero, and a complete copy of Quintilian, an author who had a marked influence on the humanistic education of the Renaissance. Many manuscripts of the Greek Classics were brought to Italy from the East by Guarino of Verona in 1408, by the Sicilian Aurispa in 1417 and 1423, by Filelfo in 1427, and by Janus Lascaris in 1492.

A new interest in Greek learning had been awakened in Italy before the fall of Constantinople in 1453; and several of the Greek immigrants, who reached Italy between 1430 and 1447, took part in the great scheme of Latin translations of

¹ In the Code from year to year there is no head master or head mistress of a public elementary school; only a principal or (lately) a head teacher.

the principal Greek prose authors formed by Nicolas V, who was Pope from 1447 to 1455. Among the Italians associated with the scheme was the translator of Herodotus and Thucydides, Laurentius Valla (1407–1457), who, by denouncing the “donation of Constantine,” became one of the founders of historical criticism (1440). After the fall of Constantinople, there was a further immigration of Greek refugees, some of whom, notably Janus Lascaris and Marcus Musurus, took part in preparing printed editions of the Greek Classics. With the aid of Musurus and other scholars, Aldus Manutius produced at Venice, between 1494 and 1515, no less than twenty-seven *editiones principes* of Greek authors and Greek works of reference. Before 1525 the study of Greek had begun to decline in Italy, but meanwhile an interest in that language had been transmitted to the lands beyond the Alps.

Petrarch had restored Cicero to a position of prominence, which had been in abeyance during the Middle Ages; and, in his Letters, had made Cicero his principal model. The *imitative* character of Italian scholarship in this age may be further illustrated by Politian (1454–1494), who, in the province of Latin prose, denounced the Ciceronians of his day as the “apes of Cicero.” In 1528, the pedantic imitation of Cicero was wittily discussed in the *Ciceronianus* of Erasmus (1466–1536), who, as a cosmopolitan scholar, had a still wider influence in France, England, Italy, Germany, and Switzerland than in his native Netherlands. He served the cause of education, not only by general treatises on the subject, but also by lucid text-books on syntax and style, which soon superseded the dull mediaeval manuals.

2. French Period. The French Period is mainly marked by a many-sided knowledge of the subject-matter of the Classics, by an industrious *erudition* rather than by any special cult of the form of the classical languages. It begins with the foundation of the *Collège de France* by Francis I, in 1530, at the prompting of Budaeus (1467–1540), and it ends about the year 1700. It is the age of the great *Polyhistor*s of France, but not of France alone. Its earliest representative is Budaeus, who, in his celebrated *Commentarii Linguae Graecae* (1529), aimed at elucidating the legal terminology of Greece and Rome. Then follows the learned Lambinus (1520–1572), with his great editions of Horace, Lucretius, Cicero, and Plautus. A still higher distinction was attained by Scaliger (1540–1609), the son of a less eminent scholar of Italian origin. While Scaliger regarded the Italian type of scholarship, with its fancy for the *imitation* of the ancients, as a merely frivolous pursuit, he led the way towards a sound system of emendation by following the genuine tradition of the MSS. After thus making his mark as a textual critic, he became the foremost authority on the chronology of the ancient world by the publication of the two great treatises of 1583 and 1606 (*De Emendatione Temporum* and *Thesaurus Temporum*). The latter was produced at Leyden, where he passed the last fifteen years of his life. With his younger contemporary Casaubon (1559–1614), as with Scaliger, language was not an end in itself, but a means for the recovery of the vast body of learning enshrined in the works of the ancient Classics. Casaubon's stay in England for the last few years of his life was immediately preceded by the publication of his *Polybius* (1609), with a preface urging the

importance of classical history as a subject of study for statesmen. Salmasius (1588–1653) distinguished himself mainly as an erudite commentator, and, after his call to Leyden as the ultimate successor of Scaliger, produced an exhaustive treatise on the history of usury (1638). Late in the same century, Du Cange (1610–1688) became famous for his great *Glossary of Mediaeval Latin* (1678); and Mabillon (1632–1707), by the production of his work *De Re Diplomatica* (1681), did the same important service to the palaeography of Latin that was subsequently rendered to that of Greek by the *Palaeographia Graeca* (1708) of another learned Benedictine, Montfaucon (1655–1741).

Early in the same age, the foremost scholar of Italy was Petrus Victorius of Florence (1499–1585) the acute interpreter of Cicero's Letters, and the exhaustive commentator on Aristotle.

In 1536–1550 the literary criticism of Italy was under the special influence of Aristotle's treatise on Poetry, a critical edition of which was prepared by Robortelli (1516–1567), who also published in 1557 the earliest treatise on the art of textual criticism. His rival, Sigonius (1524–1584), was the first to apply accurate criticism to the chronology of Roman history. In 1535 the eminent Ciceronian, Nizotius, published a valuable work which is still in use under the name of the *Lexicon Ciceronianum*. An able Ciceronian of French birth, Muretus (1526–1585), who lived in Italy for the last twenty-five years of his life, was long regarded as the most perfect model for modern Latin prose.

In the same age, the Netherlands were represented by the great Latin scholar, Justus Lipsius (1547–1606), honorary professor of History at Leyden from 1579 to 1591, whose main strength lay in textual criticism and in exegesis, and whose masterpiece was an edition of Tacitus (1574 and 1600). A wider field of learning was cultivated by Gerard John Vossius (1577–1649), professor at Leyden in 1622–1631, who published important works on *Rhetoric* (1606) and *Poetry* (1647). The principles of Aristotle's treatise on Poetry, as set forth in 1611 by Daniel Heinsius of Leyden (1581–1655), became familiar to scholars in Holland, France, and Germany, and to Ben Jonson in England. At Leyden, Heinsius was succeeded by J. F. Gronovius (1611–1671), who produced editions which marked a distinct advance in the study of Livy, of both the Senecas, and of Pliny the Elder, and Tacitus. Nicolaus Heinsius (1620–1681), the only son of Daniel, published important recensions of Latin poets, including Virgil and Ovid, Claudian and Prudentius.

Lastly, Niebuhr's critical method of dealing with the early history of Rome was anticipated, in 1685, in the *Animadversiones Historicae* of Perizonius (1651–1715).

3. The English and Dutch Period. The English and Dutch Period begins with Richard Bentley (1662–1742), and ends about the close of the century. It is the age of historical and literary, as well as verbal, *criticism*. Both of these were ably represented by Bentley during the half-century of his literary activity—from 1691 to 1742. His *Dissertation upon the Epistles of Phalaris* (1697 and 1699) marks an epoch in the history of classical learning. It is not only a masterpiece of controversy and a storehouse of erudition; it is also an example of critical method, heralding a new era. Bentley became Master of Trinity, Cambridge, in 1700; and subsequently produced important

editions of Horace, Terence, and Manilius. He was the founder of an exact knowledge of classical metre; he was also a man of wide learning and of independent judgment. In textual as well as historical criticism, he stands on the same high level as the great Scaliger.

Bentley's influence on Dutch scholarship is best represented by his younger contemporary and correspondent, Hemsterhuys (1685-1766), who was prompted by the great English critic to acquire an accurate knowledge of Greek metre. His character as an inspiring teacher is ably portrayed by David Ruhnken (1723-1798), who left Germany to learn Greek at Leyden. Ruhnken's own portrait is no less ably drawn by his favourite pupil, Daniel Wytenbach (1746-1820), who, like Ruhnken, left his native land to learn Greek at Leyden, and afterwards became famous for his complete edition of Plutarch's *Moralia* (Oxford, 1795-1821).

Meanwhile, in England, in the twenty years between 1783 and 1803, verbal criticism was the peculiar province of Richard Porson (1759-1808), Fellow of Trinity College, Cambridge, and Professor of Greek, whose masterly editions of four plays of Euripides (1797-1801) were followed, in 1802, by a second edition of the *Hecuba*, in which he stated and illustrated the rules of iambic and trochaic metre. By the marvellous accuracy of all his work, he became, for Cambridge and for England, the creator of a new ideal of finished and exact verbal scholarship.

Among German schoolmasters who did much for the cause of classical learning in the first half of the eighteenth century was the erudite Johann Albert Fabricius, of Hamburg (1668-1736), author of the great history of Greek literature, entitled the *Bibliotheca Graeca*. Another able schoolmaster, J. M. Gesner (1691-1761), for the last twenty-seven years of his life professor at Göttingen, produced, in 1749, an important Latin lexicon, which was destined to be surpassed in 1771 by that of the industrious Italian scholar, Forcellini. Gesner was one of the foremost leaders in the movement known in Germany as the New Humanism, which subsequently owed much to the influence of Winckelmann, Lessing, and Herder.

A new interest in ancient literature and art was also awakened at Göttingen by Christian Gottlob Heyne (1729-1812). He produced editions of Virgil, Pindar, and the *Iliad*; but he was also the founder of that branch of classical learning which deals with things, as contrasted with words—archaeology (in its widest sense) as contrasted with language and literature. A revived appreciation of his influence has lately led to his being regarded as marking the dawn of a new era in classical scholarship.

4. **The German Period.** The German Period has long been held to have begun with Heyne's pupil, Friedrich August Wolf (1759-1824), who, as professor at Halle from 1783 to 1806, awakened a new enthusiasm for the study of ancient life in the schools and universities of Germany. In France, the publication of the *scholia* to the Venice MS. of the *Iliad*, by Villoison in 1788, had supplied a proof that the current text of Homer was different from that of the Alexandrian critics. Following this hint, Wolf produced in his *Prolegomena* to Homer (1795) a work that roused into life the great controversy on the Homeric question. In one of his later works, he was one of the first to present

a systematic description of the vast fabric which he called by the name of *Alterthums-Wissenschaft*, and to point to a perfect knowledge of the many-sided life of the ancient Greeks and Romans as the final goal of the modern study of the ancient world. Wolf may thus be regarded as the founder of the *systematic* type of scholarship characteristic of the fourth, or more or less distinctively German period.

In the age succeeding that of Wolf, Gottfried Hermann and August Boeckh were the heads of two rival schools of classical learning: (1) the *grammatical and critical*, making the text of the Classics, with questions of grammar and metre and style, the main object of study; and (2) the *historical and antiquarian*, already represented by Niebuhr (1776-1831), investigating the history and archaeology of the old classical world.

As professor at Leipzig, Hermann (1772-1848) always insisted on a first-hand knowledge of the writings of the ancients. He applied to the study of Greek syntax a logical (and even a metaphysical) method, and, following in the track of Bentley and Porson, did much for the study of ancient metre. He also did good service to the textual criticism and the interpretation of the Greek poets.

As the leader of the historical and antiquarian school of classical learning, Boeckh (1785-1867) published in Berlin two important works: the *Public Economy of Athens* and the first two folio volumes of the *Corpus Inscriptionum Graecarum*. His systematic survey of the whole field of classical learning (published in 1877) shows a marked advance on that of his master, Wolf. The favourite pupil of Boeckh was K. O. Müller (1797-1840), author of able works on the Dorians, and on the History of Greek Literature and on Ancient Art. The study of art and archaeology was promoted by the Archaeological Institute, founded in 1829 in Rome, which was at first international in its character.

Among Latin scholars in Berlin, Karl Lachmann (1793-1851) became famous as the editor of Lucretius (1850). Here and elsewhere, his great exemplar was Bentley. By the principles laid down in the prolegomena of his own edition of the Greek Testament (1842), he was the founder of a strict and methodical system of textual criticism, with the two distinct aims of *recensio* and *emendatio*. Friedrich Ritschl, of Bonn and Leipzig (1806-1876), was not less famous as the editor of Plautus (1848-1854), and as an investigator of the history of the Latin language in his great collection of Ancient Latin Inscriptions (1862).

The history of Greece was vividly set forth, and the exploration at Olympia successfully promoted by Ernst Curtius, of Göttingen and Berlin (1814-1896). In Berlin, he was the colleague of Theodor Mommsen (1817-1903), whose brilliant *History of Rome* (1854-1856) was supplemented by his works on Chronology and on Coinage, on the Rule of the Provinces, and on Public Law. Mommsen also obtained the sanction of the Berlin Academy for the publication of a complete collection of Latin Inscriptions, and himself edited four of the forty folio volumes. He combined breadth of learning with lucidity of style, and vast powers of work with a genius for scientific organization.

In the earlier stages of Mommsen's study of inscriptions, he owed much to the great Italian

archaeologist, Bartolommeo Borghesi (1781-1860). In France, Latin lexicography was represented in the same age by Quicherat (1799-1884), and Greek by Alexandre (1797-1870). The able Aristotelian, Charles Thurot (1823-1882), was an authority on the history of education and on the grammatical studies of the Middle Ages; while histories of Criticism among the Greeks, and of Hellenism in France, were ably written by Émile Egger (1813-1885). The study of archaeology was greatly advanced by the foundation of the French School of Athens, in 1846; and the foundation of the *École pratique des hautes études*, in 1866, by the classical historian, Victor Duruy, coincided with a renaissance of classical studies in France, which has been described by Salomon Reinach as "an alliance between the French qualities of clearness and method, and the solid learning of other nations."

In Holland, the greatest representative of conjectural criticism has been Carolus Gabriel Cobet (1813-1889). In Belgium, Ancient Law has been ably expounded at Louvain by Thonissen (1816-1891) and Willems (1840-1898). In Denmark, the foremost classical scholar was Madvig (1804-1886), whose best work was devoted to the study of the Latin language and the text of Cicero and of Livy, and who laid down the principles of textual criticism in the admirable introduction to his *Adversaria Critica*.

In England, the Porsonian tradition was maintained at Cambridge by Dobree (1782-1825), and C. J. Blomfield (1786-1857). A wider variety of interests was manifested by F. A. Paley (1816-1888), the editor of Aeschylus; and Sir Richard Jebb (1841-1905), the editor of Sophocles, and the author of *The Attic Orators*, and of briefer works on Erasmus and Bentley, and on "Humanism in Education." At Oxford, the Porsonian type of scholarship was represented by Elmsley (1773-1825), whose editions of the *scholia* on Sophocles was published by Gaisford (1779-1855), the editor of many learned recensions of writers of Greek prose. As professor, Gaisford was succeeded by Jowett (1817-1893), whose admirable translations of Plato, Thucydides, and the *Politics* of Aristotle contributed largely to a renewed interest in those authors; while the next occupant of the Greek Chair, Ingram Bywater (1840-1914), did much for the text of the *Ethics*, and for the interpretation of Aristotle's treatise on Poetry. At Cambridge, a masterly edition of Lucretius was produced in 1864 by H. A. J. Munro (1819-1885), and an erudite commentary on Juvenal by J. E. B. Mayor (1825-1910); while, at Oxford, John Conington (1825-1869) became widely known as the editor of Virgil, and Robinson Ellis (1834-1913) as the learned and acute critic of Catullus.

The study of archaeology has been fostered by the foundation of the Hellenic and Roman Societies (in 1879 and 1911), and the British Schools of Archaeology at Athens (1883) and Rome (1901). The latter were immediately preceded by the American Schools of Classical Studies at Athens (1881) and Rome (1895). The Classical Association of England and Wales, founded in 1903, aims at "promoting the development and maintaining the well-being of classical studies"; while, under the auspices of England in Egypt, the recovery of lost Classics has been associated (as in the age of the Renaissance) with a renewed interest in Greek and Latin literature.

J. E. S.

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CLASSICS IN EDUCATION, THE VALUE OF.—

It is generally admitted that no man is "educated" unless he is acquainted with one foreign language at least. To detect and to shake off the prejudices and illusions incident to an exclusive regard to our "mother" tongue is a task too difficult for the unaided intelligence of most people, whose natural attitude to language is reflected in such popular utterances as: "The French call bread 'pain', the Germans 'brod', and it is *only* 'bread' after all"; "In France, Parker, they do not say 'yes', but 'oui'?" "Lor, Miss, *how mean!*" Contrast with these the noteworthy saying of Ennius, the father of Roman poetry, that he had three souls (*corda*) because he knew Latin, Greek, and Oscan.

The claims of any foreign language in which we include its literature, and therefore those of Latin and Greek, may for convenience be considered under two heads, form and contents: the first being the expression of thought in language; and the second, the thoughts, in the widest sense, thus expressed.

Against the study of the classics, it is urged that they are now "dead" and destitute of value. This contention, really directed against all study of the past, rests upon a confusion. In certain branches of knowledge, the past may be said to be gathered up into the present, and for future progress only this need be regarded. So in sciences dealing with properties of matter and number; as Biology, Physics, and Mathematics; so also with their practical applications as engineering. Not so with those that deal with man in his social, moral, and intellectual activities and development. These draw their materials almost wholly from the past; and for them, in the fullest sense, "What has been, is." It is allowed that Greek and Roman thought and civilization have influenced profoundly modern thought and civilization, and this doubly—directly from the ancient sources and indirectly through the modern tongues. French, Italian, Spanish, and Portuguese are children of Latin, and English would have to be classed as neo-Latin, too, were the constitution of its vocabulary alone to be considered. The history and the culture of the ancients can, though with disadvantage, be studied without knowledge of these languages, and it is said that for other purposes translations (*q.v.*) are sufficient. This is not so. Bald statements of fact may thus be reproduced; but what is most precious in an original, the native spirit and quality, is just what escapes in translation. Hence the classical

writers' philosophy, oratory, and, above all, their poetry, to which its form is so vital, are largely untranslatable.

Considerations of "Form." In selecting foreign languages, we should choose those of nations superior, or at least not inferior, to ourselves, whose characteristic qualities will help us to observe and amend what is defective in our own. The faults of non-inflexional languages are best corrected from inflexional; and we can learn more from Latin and Greek, whose inflexions are full and clear, than from French and German when they are meagre and decayed.

The arrangement of expressions according to their relative stress and importance is impracticable in English, in which the order of words is almost exclusively grammatical; and the pauses and intonations, which take its place in speech, are unrecognized in writing. Hence reported speech is often indistinguishable from narrative. Other weaknesses of English are the common omission of leading ideas and necessary links of thought, which the hearer or reader is forced to supply, an extravagant and indiscriminating use of "synonyms," regardless of the Socratic dictum that we should always apply the same terms to the same things; and (a fault not confined to English) the reckless use of abstract nouns. These abstracts are often but abbreviated generalizations, or formulæ with the qualifications that alone make them real omitted. They are thus liable to be confused with real entities; and our thought goes in bondage to *-thes* and *-ations*. From these and other severings from reality has come the English habit of thinking under and away from the words, an unconscious incoherence responsible in part, it would seem, for the reputation which a really honest people has obtained for hypocrisy. From all these defects the simple, straightforward, and concrete speech of Latin and Greek is free. For the "romantic" bias of modern thought in the exaggerated rôle assigned to sentiment and emotion, and the exaltation of will over reason, the study of the classics offers the best corrective; and the fundamental moral and social issues are, to begin with, studied best in the simpler conditions of antiquity than in the tangled complexities of modern time.

Considerations of "Content." In the opinion of judges who possess the requisite experience and discrimination, the Greek literature is the greatest that the world has seen. For imagination and insight, for sense of beauty and harmony, for clarity, sanity, and equipoise, it is surpassed by none. That of Latin does not stand so high; but the names of Lucretius and Catullus, of Virgil and Horace, of Cicero, Livy, and Tacitus are sufficient warrant of its importance. In quantitative metre the classical poets possessed a matchless instrument whose beauty and fascination can be appreciated only in the originals. Of the Virgilian hexameter, Tennyson writes that "it is the stateliest measure ever moulded by the lips of men." The charm of such metres is shown by the numerous but ineffectual attempts to naturalize them in English.

The value of the classical training is attested not only by those who can speak from their own actual experience, but by those who have observed its effects in others, such as the Austrian chemist Bauer, who declares that, in chemistry, students from the Classical Gymnasium soon leave those from the *Realschulen* behind; and public men like John

Bright, who "greatly regretted not having had a classical education." J. P. P.

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CLASSIFICATION IN INFANT SCHOOLS.—The classification of children in infant schools is of great importance, yet it does not seem to have attracted much attention from educational experts or students of child-nature. The old order has been blindly followed, year after year, the children being arranged rigidly according to age, with little opportunity of exercising their individualities and developing their senses methodically and rationally.

The aim appears to be to force all children at the same rate merely for the sake of drafting them into the senior school and getting them through the standards as quickly as possible.

Numbers of children arrive at the top standard early and have, literally, to waste their time until the leaving age, because there is no teacher at liberty to attend to their instruction. Surely these boys and girls would be better equipped for the world had they been given more opportunity for natural development in the earlier stages!

The main feature of a new scheme, which has for some time been the subject of experiment, is the division of the infant school into two sections, with the provision of such an environment as to allow all the children to work freely and independently.

The lower section is composed of parallel classes of mixed ages, each class containing children of 3, 4, and 5 years of age.

The upper section consists of parallel classes containing children 6 or 7 years old, who have been promoted from the lower section after having received some definite, methodical sense-training, and acquired the elements of writing, reading, and number by means of the Montessori apparatus. The children are preparing for Standard I in the senior school, and work independently, each according to its own stage of attainments, at its own rate, and of its own initiative.

The results of this classification have been very gratifying. Some of the advantages are—

1. It makes individual work possible.
2. It permits the youngest children, who require most care and attention, to be distributed so that each teacher is responsible for only a few. The little ones also can often be helped by the older children, thus relieving the teacher. This is character-training, making the children think for others and use judgment.
3. The mixing of ages allows a child, newly admitted, to be put into the same class as an older brother or sister, or little friend. Thus the child comes into the strange new environment with some one to help it.
4. There is a great saving of apparatus.
5. The children learn from each other by seeing exercises performed which they want to imitate for the sake of the new activity provided.
6. A child that has no brother or sister is brought into relation with older and younger children of both sexes. This enriches the child's character, and qualifies it to cope with the social difficulties of later life.

7. During the winter months and in inclement weather, under the old classification the babies' class is generally reduced to a very small attendance. Under the new classification, all classes in the lower section are equally affected. This is a distinct advantage to the teachers.

M. BLACKBURN.

CLAY MODELLING.—(See MODELLING [CLAY], THE TEACHING OF.)

CLEEVEE, EZEKIEL.—(See NEW ENGLAND COLONIES, EARLY HIGHER EDUCATION IN.)

CLELAND, JOHN.—(See NOBLES AND GENTRY, EDUCATION OF.)

CLEMENT OF ALEXANDRIA AND HIS RELATION TO EDUCATION.—The significance of Clement of Alexandria (c. A.D. 150–215) in the history of education lies in his use of Greek philosophy as an aid to the interpretation of the Christian faith. There was danger of the less far-seeing sections of the Church rejecting secular culture as useless, or even harmful; and a party called "orthodoxasts" existed at Alexandria, whose watchword was: "Faith only" (1 *Strom.* IX: Stählin, vol. II, 28, 20; 30, 17). Clement believed that "the way of truth is one, yet many streams flow into it from every side" (1 *Strom.* V: St. II, 18, 8–10), and that all good things come from Providence (1 *Strom.* V: St. II, 17, 34–5). In this attitude he was followed by Origen, and by the Church generally afterwards. Clement is essentially a teacher. Religion is a divine training of humanity by the Word, and the world a "common schoolhouse" (*Quis dives salv.* 33: St. III, 182, 14). The learner's first need is to know his ignorance (5 *Strom.* III: St. II, 336, 25–6), and even the teacher "learns while teaching" (1 *Strom.* I: St. II, 9, 20). Truth is reached only by "time and toil" (1 *Strom.* I: St. II, 12, 11). One of Clement's works is entitled the *Paedagogus*, or *Tutor*; another, no longer extant (unless it be identical with the *Stromateis*), was called the *Teacher*. Clement is concerned with the training of men in philosophy and theology (the two were one to him), not with the teaching of children. The "fresh catechumen" (6 *Strom.* XV: St. II, 497, 25), to whom he lectured in the Catechetical School, had probably received the "encyclical training," consisting of music, geometry, grammar, rhetoric, and astronomy (1 *Strom.* V: 6 *Strom.* X: St. II, 19, 10–13; 471, 21–32), and leading up to dialectic, which Clement, following Plato (*q.v.*), regards as the "coping-stone" of these preliminary studies (6 *Strom.* X: St. II, 472, 17–18 Plato, *Rep.* 534e). By means of dialectic, each study is made to yield its contribution to knowledge, which, in its highest form, lies beyond sensible things and is reached by applying the "bare energy of the soul" to intellectual objects (6 *Strom.* I: St. II, 423, 17–25). Consequently, Clement does not greatly value natural science, though he is acquainted with current teaching and can appreciate Nature's wonders. Nor does he honour the arts, which, though useful and necessary, divert the soul from contemplation of the truth (1 *Strom.* XIX: 5 *Strom.* V: St. II, 59, 23–5; 344, 7–11). A strong moral interest, springing not only from Christianity, but also from Plato and Stoicism, runs through Clement's theory of education: self-control and right dispositions are, equally with correct

knowledge, the fruit of true philosophy. Hence unlettered Christians may become "philosophers" (4 *Strom.* VIII: St. II, 275, 2–8); nevertheless they cannot fully understand the faith without the aid of learning (1 *Strom.* VI: St. II, 23, 6–8); Women are capable of sharing in the philosophic training in both its intellectual and its moral aspects (4 *Strom.* XIX: St. II, 300, 5–302, 15).

G. W. B.

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CLENARD, NICHOLAS.—(See CLEYNARTS.)

CLERGY, CLERK.—The word is derived from Greek *κλῆρος* (a lot or inheritance), and the clergy were the men of God's lot or inheritance. The tribe of Levi was described as "the lot and heritage of the Lord." The term has been used from early times to denote the ministers of the Christian Church, and was extended to all holders of office therein. From an early date, also, the use of a distinctive dress marked the clergy from the laity. In Norman-French, the word "clerc" denoted one of the clergy; and, as these were almost the only persons who could read and write, the word "clerk" and "clerical" came to be associated with readers and writers.

CLERGY OF THE CHURCH OF ENGLAND. TRAINING OF, THE.—In the earliest days of the English Church, schools for the education of the clergy were founded in connection with the various cathedral churches; and the great collegiate churches followed the example of the cathedrals at a later date. Here the future clergy were not only trained in the learning of the day, but also took some share in the daily devotional life of their clerical teachers, and were in touch with their charitable and pastoral activities. When the Universities of Oxford and Cambridge were founded, their organization was not arranged for the special requirements of any one class, and hence no professional training was provided for clergy. But the colleges in the Universities were ecclesiastical in their arrangements, and in them a great number of the secular clergy were educated. It was a loss that they had no special preparation for the pastoral office, such as might more easily be had at the cathedral and collegiate churches; but this loss was, to a certain extent, balanced by the collegiate life and by the general culture and wider outlook which they learned from the free intercourse and educational opportunities of academical life.

History to 1800. Before ordination, it was canonically required that every ordinand should be examined for three days by the Archdeacon. A general idea of the examination may be gathered from John de Burgo's (ob. 1386) *Pupilla Oculi*, or from Lyndwood's *Provincials*. The standard required was probably never high; sometimes, as after the Black Death and in the early days of the sixteenth century, it fell very low. Perhaps the result of the examinations of the clergy in the early days of Elizabeth give a fair idea of the average clerical attainment. Whether ordained in

the reign of Henry VIII or later, a considerable number of them had had little education: they may have been diligent pastors, but they knew little Latin and very little "sacred learning" (see e.g. Bishop Cooper's *Liber Cleri*, in "Lincoln Episcopal Records," Canterbury and York Society). At the Reformation, the religious houses were swept away, and many of the great collegiate churches and the cathedrals were greatly impoverished. Thus a large part of the provision for clerical training disappeared. The Universities only were left, with their great advantages as places of general education and their disabilities in the way of professional preparation for pastoral work. Cranmer proposed to establish again training schools for clergy in connection with all cathedrals; but the proposal came to nothing, although, at a later date, it received the support of Lord Bacon. The Canon of 1603 (Canon 34) enacted that no bishop should ordain any person "not of his own diocese" except he bring "letters dimissory" from another bishop, or be a member of one of the Universities. This Canon left room for Cranmer's project, and one or two bishops (specially Burnet of Salisbury) tried to train candidates in their own dioceses; the Universities protested and carried the day, and until the nineteenth century they remained the only seminaries of the English Church. Of course, they were then in close relation to the Church: but whatever may have been the religious advantages resulting from that relation, those advantages were the common property of all their alumni and constituted no kind of special clerical training. There was no such training provided anywhere in the English Church throughout that period. An ordinand was required only to have a degree in some school in one of the Universities and to produce "letters testimonial" of his good life and conversation from his College.

The Nineteenth Century. In 1840, Regius Professorships of Pastoral Theology were founded at the two Universities; and about that time, also, graduates who desired ordination were required to reside for a term or more after taking their degree and to attend the lectures of the Divinity Professor. But a little later a new regulation allowed these lectures to be taken during undergraduates' residence, and so their chief value was greatly impaired; in fact, they were made practically valueless, at least in Oxford. In the middle of the nineteenth century, the movement to provide theological colleges for clerical training, apart from the Universities, began. The first of such colleges were for men who were not members of the Universities. The Canons had allowed for the ordination of men who "at least" had some knowledge of Latin and could produce Scripture proofs of the Thirty-nine Articles. No doubt some good men were ordained under this provision, but it admitted many very ignorant clergy. The first college for training these "literates," as they were then called, was founded at St. Bees in 1816: in the middle of the century it had 120 students under tuition. But the teaching was not of a high class, and, at the end of the century, a rise in the examination standard for ordination caused it to close its doors. Before that day, better institutions had taken up the work: one was founded at Birkenhead in 1847, at Lichfield in 1857, at Salisbury in 1860, and at Lincoln in 1874. In these, "non-graduates" (as they are now called) are trained for two years for the Bishop's ordination examination, for practical work

and in the devotional life; and these colleges give as good a training as is possible in so short a time to men who have not had the best advantages of early education.

Missionary and Professional Colleges. For the same class of men, missionary colleges were also founded at this time: in 1826, Islington Missionary College; in 1848, St. Augustine's, Canterbury; and others at a later date. In these colleges, the course extends for three or four years; and special instruction is given in subjects useful in the mission field. At the same time, the first attempts were made to supplement the University training with a period of professional education. The first college for this purpose was opened at Wells in 1840; another at Cuddesdon in 1854; at Ely in 1876; and afterwards at Leeds, Ripon, Farnham, Chesham, and other places. One or two attempts have been made in each university to give such training in connection with the university: in Oxford, St. Stephen's House and Wycliff Hall; and in Cambridge, Ridley Hall and the Clergy Training School have been founded. Cambridge is more successful than Oxford in this respect; but graduates, as a rule, prefer to be trained away from their Universities. In these graduate colleges, a year's training is provided on the same lines as the two years' training of the non-graduate colleges. A very good sketch of the life of such a college on its various sides is given in *A History of Cuddesdon College*, published by Longman in 1904. The foundation of these colleges was a great advance in clerical training; their work has undoubtedly raised the level of the ministry of the English Church. But, so far, the training given is not compulsory on all ordinands, although very great numbers avail themselves of it; and the year is too short for all that has to be done. The weakness of non-graduate colleges is the lack of early education in its members; the weakness of a graduate college lies in the shortness of its course. Clerical training is also now provided in colleges which do not fall under either of these headings. King's College stands by itself in preparing men for its status of A.K.C. or for degrees at the London University, and also for ordination at the same time. The "Community of the Resurrection" at Mirfield trains a number of men for a degree at Leeds University, and afterwards gives them a two years' theological course. The "Society of the Sacred Mission" at Kelham, near Newark, provides a very sound general education, apart from any university, and a two years' theological course. All these efforts needed to be correlated and improved. In 1907 the Archbishop of Canterbury, at the request of the bishops, appointed a committee to examine the whole question of clerical training. A very valuable report was issued by the Committee in 1908, summarizing the condition of training and making proposals for its improvement. Some of these proposals must wait for the necessary funds, but two have already been carried out. The bishops of both provinces have decided that, after a certain date, all candidates for ordination must be graduates of a university, and must have had a year's special training for clerical work; and they have also appointed a large Central Advisory Council of Training for Holy Orders to deal with all questions of training and examination for ordination. The first of these two decisions of the bishops both raises the standard of general education for those who are now ordained as non-graduates, and it also makes professional training

compulsory for all. The second decision has provided a body of men with power to inspect theological colleges, to advise about the foundation of new colleges, to improve the examinations, and to promote unity of action among all who are concerned in the work. In its short life, the Council has already begun much useful work; but in its very existence the Church of England has an instrument for pressing forward reform in clerical training such as it never before possessed.

The Universities will always provide the best educated of our clergy, but means must be found in future for giving them a much longer professional training. The problems that lie before the "non-graduate" part of the work are much greater: vocations for the ministry are found in all classes, and yet no one must be ordained without his having some kind of good education. How this is to be done, remains to be solved. J. O. J.

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CLERGY (ROMAN CATHOLIC), THE TRAINING OF THE.—(See ROMAN CATHOLIC CLERGY, THE TRAINING OF THE.)

CLERICAL SCHOOLMASTERS.—It may be said that practically all schoolmasters were either in orders or under monastic rule in the period before the Reformation in England, and that after the Reformation the tradition very largely continued even into our own time in the case of endowed foundations. It is, indeed, only to-day that the lay head master has largely replaced the clerical schoolmaster. But it is necessary to note the early exceptions to this rule. What were known as Adulterine schools, forbidden schools not carrying the license of the *Magister scholarum*, were quite common in the Middle Ages, and many of these were not conducted by men in holy orders. The Lollard schools were conducted by laymen or, at any rate, by men only holding orders conferred by these dissenting bodies. Again, there were schools that were private as opposed to endowed or collegiate schools, and openly competing with them, as in the Gloucester Grammar School case (*Year Book*, II. Hen. IV. p. 47), decided in 1410. Again, there were schools kept by women other than nunnery schools. After the Reformation, dissenting schools became common, and were sternly but not always successfully attacked. The bishops' licensees did not comprise the whole of the public and private teachers. Moreover, the usher, who became usual in endowed schools in Elizabethan times, was rarely in orders, and many head masters were also laymen. The movement in favour of lay teachers steadily increased and spread to the parochial elementary schools, which throughout the Middle Ages had been exclusively taught by the parish priests. No doubt this was still the case in most parishes in the Elizabethan Age, but dissent was busy with its own schools. During the school endowment movement between 1660 and 1730, lay schoolmasters abounded; and, of course, this was also true for elementary schools generally from the revival under Bell and Lancaster at the opening of the nineteenth century. J. E. G. DE M.

CLEYNARTS (CLENARD), NICHOLAS (1495–1543).—Born at Diest, near Louvain, and a student in the University of Louvain. He became licensed in theology in 1519, but his chief interest as a student lay, first, in the study of Latin, Greek, Hebrew, Chaldean; and, later, the knowledge of these languages led to a keen delight in the study of the methods of teaching them. As a youth, he took pleasure in joining the group of students who thronged before the shop of the bookseller Jasper at Louvain, played as an actor in a Latin comedy, and was authorized to teach students of the University (publicly and privately) Greek and Hebrew in 1520—the year in which John Campensis was appointed to the Chair of Hebrew in the College of the Three Languages at Louvain. In 1529, Clenard lost, by one vote, an official post in the cathedral at Louvain, and soon afterwards received a nomination to the chaplaincy of the Béguines at Diest. But his nomination was legally disputed, and he was involved in a long legal process, and determined to leave the neighbourhood and the country. In the meantime, about 1530, he went to Paris, taking with him copies of his *Meditationes Graecanicae*, which he hoped to sell there. At Paris, he met Almeida, who fascinated him with his talk about Arabic and the Professor of Arabic at Salamanca, so that he longed, on his return to Louvain, to find the opportunity to go to Spain. At Louvain, he had no Arabic masters, books, or MSS. Someone "who knew his malady" sent a book of Psalms in Hebrew, Greek, Arabic, and Chaldean, with Latin translation, the work of Augustin Giustiniani, bishop of Nebbio, in Corsica. He studied this book, making an alphabet by means of comparison of the proper names of persons and places. On discovering a letter, he describes his feeling as that of "a miner when he discovers a nugget of gold." By comparison of languages, in this Psalter he provided himself with an Arabic alphabet, glossary, grammar, syntax—all worked out or "discovered" for himself.

Adventures in Spain. In 1531, Ferdinand, the son of Christopher Columbus (the discoverer of America), came to Louvain. Ferdinand Columbus was a distinguished book-collector. Of his books, many are lost; but still at Seville there remain 4,000 books of his collection. He travelled all over Europe to find choicely printed and MS. works—little more than half a century after the invention of printing. On the last leaf of each of his books was placed the date and place of purchase.

Ferdinand Columbus had visited the chief cities of Spain, Italy, and the Low Countries; and in June, 1522, was in London. In 1531, at Louvain, he easily persuaded Clenard to accompany him back to Spain, and the latter agreed to remain three years in his service. Ferdinand Columbus and his party reached Salamanca, where Clenard begged release from his engagement, and this was granted by Columbus, who always retained friendship for Clenard. At Salamanca, Clenard found, to his grief, that Almeida's statement as to a Professor of Arabic was incorrect; but he stayed two years (1531–1533) at Salamanca and gave himself up to Arabic studies, and to the teaching of Latin and Greek, and attracted large numbers to his lectures. The Portuguese scholar, de Resende, secured for Clenard the tutorship of John III's brother's son at Evora, and won Clenard's acceptance of the post by informing him that there was at Evora a physician who knew Arabic. From 1533 to 1537,

he lived with the Portuguese Court; taught the royal children; and, under favourable conditions, pursued Arabic studies.

Teaching at Braga. In 1537 he accompanied Prince Henry to Braga, and became wrapt up in school-teaching. He offered to teach any pupils Latin in a public building. Pupils of all ages came: parents together with their children. He took with him to the public teaching three slaves, whom he had bought: Michael Long-tooth (Dento), Antonius Blackamoor (Nigrinus), and Sebastian Charcoal (Carbo). The people were startled by finding these Africans understanding Latin. Clenard gives a full description of his employment of the direct method of teaching Latin. Orders to leap, to crawl, and so on were given in Latin, and at once shown in action. Clenard's success was extraordinary. Pupils came an hour early. When Easter came and Clenard refused to receive pupils until they had "confessed" to the priests, the crowds turned to the priests to secure entry to the school, without loss of time. The Latin dialogues used in the school became refrains in the city; and we are told that handicraftsmen, and mule-drivers, and girls at work in houses were all singing Latin tags. It was not difficult to get Latin conversation in the schools (Clenard says), because he required the boys to discuss matters of interest to themselves and only to use Latin. No books were used, and no vernacular was allowed to be spoken. As Clenard said, we learn the vernacular by practice, and we can learn Latin in a similar way. Wherever Clenard went, he took with him the enthusiasm for teaching Latin, Greek, and Hebrew; and a simple-minded joy in perfecting a pedagogic, linguistic method of teaching Latin to pupils so diverse as an infant of four years of age, and Greek to a man of ninety; and not only to Christians, but also to Jews and infidels—and to slaves.

Throughout his career he taught orally, but his later renown was due perhaps rather to the textbooks which he wrote for Latin, Greek, and Hebrew. The whole tendency of each was to simplify grammar and to make the approaches to languages easier. He is best known, in this connection, by his Greek grammar. This was first published in 1530 at Louvain by Rutger Rescius and John Sturm, and is entitled *Institutiones Linguae Graecae*. It was followed, in 1531, by Clenard's *Meditationes Graecae*, published at Louvain by Bartholomew Gravius.

Title to Fame. Henry Hallam compared Clenard with the great scholar Budaëus (*q.v.*): "The Commentaries of Budaëus stand not only far above anything else in Greek literature before the middle of the sixteenth century. . . . What comes next, but at a vast interval, is the Greek grammar of Clenard. It was much beyond Budaëus in extent of circulation, and probably for this reason in general utility" (*Lit. of Europe*, 1855 ed., vol. i, p. 336). In Hebrew, Clenard wrote his *Tabula in Grammaticam Hebraicam* in 1529, whilst his *Institutiones Grammaticae Latinae* was published in 1538.

Entering into the traditions of Pierre Dubois (*q.v.*) and Ramon Lull (*q.v.*), Clenard longed to enter on a "peaceful crusade" for a better understanding with, and eventually the conversion of, the Mahometans to Christianity. His opportunity for the attempt came after leaving the school-teaching at Braga. After a stay of some months at Granada, and further studies of Arabic of the Koran, he crossed to Africa in 1538, and proceeded to Tetuan

and Fez. For four years he engaged in his missionary enterprise, at any moment liable to incur the martyrdom which had befallen Ramon Lull. In 1542, to escape a menacing and somewhat mysterious intrigue against him, he returned to Granada, sickened, and died, and was buried in the Alhambra.

Clenard had never forgotten the "sweet Louvain," where he had known Erasmus and Vives. His hope was by experience to enter into the life and atmosphere of the Mahometans, to understand Arabic thoroughly, and then return to Louvain, and found there a college of Oriental languages, and a great seminary, for Eastern missionaries, of learning and of the Christian religion. Clenard, therefore, was a great educationist in his method of language teaching, an enthusiastic linguist, a courageous missionary, and a projector of the great idea of the West meeting the East on equal terms of knowledge or thought. He is an outstanding instance of the Renaissance school aiming at turning the revival of learning to the good of the whole world, and therefore a humanist in the best sense of the term. His *Epistolae* (first edition Antwerp: Plantin, 1566), is one of the most charming autobiographies of the period. It is most desirable that these letters should be translated into English as one of the most attractive of both the literary and historical documents of the period.

F. W.

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CLIFTON COLLEGE.—Founded in 1862, Clifton was incorporated by Royal Charter in 1877. The first head master was Dr. Percival, afterwards President of Trinity College, Oxford; Head Master of Rugby; and Bishop of Hereford. The school consists of: (1) Preparatory (50 boys aged 7-11), (2) Junior (140 boys aged 10-14), and (3) Upper (460 boys aged 13-19); each school has its own buildings and playgrounds, and its boys are kept apart from those older and younger. The Upper School is divided into three Sides—Classical, Modern, and Military. Those intended for the university or the Indian Civil Service join the Classical Side; the Modern Side is better suited for those who specialize in Science or Mathematics, or who are to take up Engineering or Business.

Boys are placed in Forms for the usual Form subjects, but a great deal of their work is done in "Sets"; thus they can be grouped for special subjects according to their ability and attainments. On the Classical Side they give about twenty hours a week to Form-work; on the Modern Side only about ten hours a week are so occupied, the remainder of the school time being spent in "Sets" with various special subjects. The Military Side is

limited to boys who are able to pass an entrance examination of fairly high standard, especially in Mathematics and French, so that there may be a good prospect of their being able to reach the standard of the Woolwich and Sandhurst competitive examinations by the end of their school career. Physical Science is taught to every boy in the school, except in the two highest Forms, where specialization has begun. There is a strong Engineering Class and an Engineer Cadet Corps.

The boarders are received in houses, one house being devoted to Jewish boys; the day-boys are also divided into two "houses" for purposes of games and discipline. There are eleven scholarships ranging in value from £25 to £100, some of these being open to all boys, whether members of the school or not, some being open to members of the school only; and three leaving exhibitions are awarded annually, besides a scholarship which falls vacant every other year.

CLIMATOLOGICAL STATIONS.—(See BUILDINGS, SCHOOL.)

CLIMATOLOGY.—(See METEOROLOGY.)

CLINICS, SCHOOL.—All successful efforts to improve the health of children must be initiated and guided by the possession of exact information of the physical conditions existing among them. The routine medical inspection of school children carried out in the schools is, therefore, of great value as a preliminary procedure. The practical steps to be taken as a result of this inspection are most important, and for convenience they have been focused at a centre called the school clinic. The name itself, indicating, as it does, the presence of beds, is by no means a descriptive one; but it is not easy to find a suitable term to describe an institution whose work is almost entirely of a novel character. The features that distinguish the work of a school clinic from similar institutions may be roughly said to be two in number. In the first place, the school clinic takes a very broad view of its responsibility towards school children in general, and each defective school child in particular. It has not merely to treat cases coming to the clinic, but it has to ascertain that all defective children are sufficiently treated. No child requiring medical treatment must remain untreated, whether the parents choose to seek treatment or not. To the school clinic it does not seriously matter whether the treatment is carried out there or not, so long as adequate treatment is secured. The arrangements of a school clinic for investigation and help are, therefore, very complete: for, in essence, the school clinic is not so much a building or a hospital as a systematic scheme for dealing with all questions arising out of medical inspection. In the second place, the school clinic differs from other children's institutions in the existence of an organic relationship with the public authorities of the area in which it works. At present, it is part of the educational system of the country; but, even if it were not, it is essential for its successful working that it should be so linked up with the Education Authority, its officers, and its teachers, that a genuine co-operation between all interested in the welfare of the school-child should be secure. In education, the school clinic acts entirely in an advisory capacity: it does not educate—at least in the narrower sense in which we have been

accustomed to use the word—but it directs the nature and extent of education, and secures fitness of the children for it. A similar close relationship is found to exist between the school clinic and the general health authority. Fortunately, in England, in all the more important districts, the local authorities for health and education are the same, and immediate co-operation is possible. Such a co-operation has rightly been insisted upon by the Board of Education, the high ideals of whose principal Medical Officer (Sir George Newman) have given that breadth of view to the work of the school clinic which is essential to its efficiency both for the health and the education of the school child.

1. **Administration.** The duties of a school clinic are said to be of a twofold character. The first has reference to inspection and the second to treatment; but it has been found impossible, in practice, to distinguish at all times between the inspection clinic and the treatment clinic. To carry out its work efficiently, the school clinic must be under the general control and direction of the local authority, and must be thoroughly incorporated with the public medical services of the area. A scientific and careful organization of the school clinic is very necessary on account of the varied nature and extent of its duties.

(a) **STAFF.** In its internal administration, the school clinic is controlled by a school medical officer, who should exercise a supervision over all the arrangements, and the staff should generally act under his direction. The size of the staff will, of course, vary according to the number of children dealt with and the amount of work to be done, but it will generally have three divisions: medical, nursing, and clerical. The medical staff consists of general medical officers and specialist medical officers; and in his relationship to it, the school medical officer does not, in a district of any size, attempt to do more than set out the general broad principles of the work, the records and the reporting, leaving the details of the medical diagnosis and treatment to be carried out by each medical member of the staff according to his own ideas and special knowledge. The general medical officers carry out, in one part of their time, the medical inspection in the schools in the district allotted to them; and, in the other part, the general medical work of the clinic. Each general medical officer becomes responsible for all his own work and supervises the work of the nurses in his district, and, through the clerical staff, makes out his own records and issues the exclusion and re-admission certificates for children in his own area. The general medical officers refer all cases requiring special medical and surgical skill for diagnosis or treatment to the appropriate specialist medical officers. These specialist officers are usually part-time officers with consulting practices, who, under arrangement with the local authority, devote specified hours each week to the work of the school clinic.

The nursing staff should consist of general trained hospital nurses with experience of children's diseases, and should, in *personnel*, number at least three times the general medical staff, as each full-time general medical officer requires the assistance of, and can readily supervise, the work of three nurses. Upon the school nurses the onus of the duty of the following up defective children in their homes usually falls, when they can ascertain what treatment is being obtained as a result of the inspection,



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and give further advice, if necessary, as to the means of obtaining it. The clerical staff need not be very large, as much of the recording can be conveniently done immediately by the medical officers and nurses. This staff is chiefly employed in the registration of cases and attendances at the clinic, the collation of and extractions from records, the issue of exclusions and re-admissions, the checking of defaulters in attendance at the clinic, and the preparation of annual and other reports.

(b) **RELATIONSHIP WITH OTHER OFFICERS.** In order that the work of the school clinic may be as useful as possible to education, the officers and school teachers of the education authority should possess easy means of access to the doctors and nurses at the clinic, so that an effective and intimate co-operation can be set up. From the point of view of education, the school clinic is a school, and the children attending there are attending school. Records of attendance have, therefore, to be kept and forwarded to school attendance officers and school teachers as persons interested in school attendance. To these persons, also, in the course of their work, information frequently comes of children suffering or suspected to be suffering from some physical disability. Such information is sent to the clinic for investigation, and in due course the results are reported back to the school teacher or school attendance officer, with advice as to the best course to pursue. Special reports must also be made from time to time on cases as they occur where any modifications of educational methods are, from the physical point of view, desirable. All these arrangements must be carried through in accordance with a scheme of mutual reporting agreed between the school medical officer and Director of Education, who requires to be kept informed of all the work done as it affects the education of the children.

In its relationship with health officials, the school clinic recognizes at all times its important part in the prevention and treatment of disease, and seeks the assistance of the health authority wherever necessary. In infectious disease amongst school children, there is a danger to the community generally; and the clinic forwards all information it receives on this point to the health officials, who, in their turn, inform the clinic of any outbreak suspected to arise from, or likely to affect, the school. In tuberculosis, the disease arises from causes outside the school life of the child; and, in accordance with the general scheme of dealing with the disease, the school clinic seeks the aid of the tuberculosis dispensary in securing observation of and treatment for the tuberculous school child. Most health authorities at the present day possess special facilities for bacteriological investigation, and these are freely utilized by the school clinic, while many other special arrangements for diagnosis and treatment may usefully be made in conjunction. Lastly, when questions of defective home conditions arise (as in dirty or verminous children), the assistance of the health authority may be sought to investigate and improve them. These illustrations give some instances of that mutual co-operation which has done so much to increase not only the usefulness of the school clinic, but also of the public service generally.

2. **The Work of the School Clinic.** The extent of the work done at the now numerous school clinics in this country varies greatly. In each case, an inspection clinic, in some form or other, will be

found; but the treatment clinic may be almost absent in some, while in others it may have reached a considerable degree of development. The general medical officers usually conduct the inspection clinic, and the general medical department of the treatment clinic; while each specialist medical officer conducts that department of the treatment clinic carrying out his own particular work. It is a convenient thing from an administrative point of view to centralize all the departments of the school clinic as much as possible; in large areas, branch clinics are necessary; but the work at the branch clinics should be confined to that of the inspection clinic and the general treatment clinic, as arrangements for special treatment are of an expensive nature, and cannot be multiplied with economy and efficiency.

(a) **INSPECTION CLINIC.** The routine medical inspection at school is usually conducted under circumstances which render impossible any very complete examination of difficult or doubtful cases. The inspection clinic forms a convenient centre for the further detailed examination of such children. Here, also, children may be referred for examination prior to their admission to special schools. More important still is the continuous supervision which this centre renders possible in those cases where children are suffering from minor ailments (scabies, ringworm, dirty and verminous condition, and the like), when very frequent observation is necessary to secure effective treatment. Again, where questions of fitness to attend school or undergo certain forms of education arise, the inspection clinic affords facilities for the examination. To put it briefly, the inspection clinic forms a centre of observation, record, and report for school medical work. It is the clearing-house through which school children or reports on school children—defective or suspected to be defective—pass.

(b) **TREATMENT CLINIC.** The amount of work the treatment clinic will carry out depends greatly on the facilities otherwise afforded in the area for school children to receive appropriate treatment. In all industrial districts, at any rate, the agencies existing prior to medical inspection of school children proved quite inadequate to cope with the new work which was then thrust upon them.

(1) *General Treatment Clinic.* This was the first development of the treatment clinic, and its work can frequently be only with difficulty differentiated from that of the inspection clinic. Here the minor ailments so frequently under observation at the inspection clinic receive, it may be, daily treatment. All sorts of minor dressings (skin diseases, inflammatory eye conditions, discharging ears and noses, and the like) and uncleanly conditions of children can be successfully dealt with by very simple means. A school nurse carries out the routine treatment under the supervision of the medical officer, and the whole cost to the authority is small when compared with the great benefits the children derive.

(2) *Eye Treatment Clinic.* The work here is best arranged under the general supervision of a specialist ophthalmic surgeon, but minor ailments of the eye and eyelids can usually be treated at the general treatment clinic; while frequently the correction of the simpler defects in vision can be carried out by the general medical officers. The more complicated eye defects and any operative work is, of course, undertaken by the ophthalmic surgeon

himself. A room of suitable length for examination by test-types must be provided, and a dark room for fundus examinations. It is necessary when this work is done to make arrangements for the provision of spectacles at cheap rates, to check their fitting at the clinic, and to re-examine periodically the children wearing spectacles.

(3) *Operative Work.* No operative work other than that done by dentists, requiring the use of a general anaesthetic, should be done at a treatment clinic, unless beds are also provided or readily available. It is, therefore, usually much more economical to arrange for operative treatment to be carried out at some hospital than at the clinic itself. Whatever arrangements are made, however, it should be clearly understood that the hospital or other institution is doing this work for the local authority, and should report its results fully to the school clinic. The operative treatment most frequently required in school children is the removal of enlarged tonsils and adenoids, and the surgical treatment of discharging ears. For this work a specialist surgeon is required; but in some school clinics this work is done and the children kept in special recovery rooms provided with suitable couches for some hours after the operation; but even this does not obviate the danger of a later haemorrhage.

(4) *"X Ray" Work.* Ringworm of the scalp is a disease requiring, if ordinary medical means are adopted, a very patient and prolonged treatment before it can be said to be cured. As ringworm is an infectious disease, this involves lengthened exclusion from school and a serious interference with the education of the child. It has now been proved that the "X Ray" treatment of ringworm greatly shortens the period required for cure, the treatment being painless, harmless, efficient, and comparatively rapid. The successful treatment of this disease requires the provision of somewhat costly apparatus amounting initially to about £300 to £400, so that only larger school clinics are provided with an installation. It is, however, greatly to the advantage of the children and education authority that some arrangements for carrying out this work even in smaller areas should be made. Some special knowledge and considerable experience is necessary in the application of "X Rays" in this condition, and it is best carried out under the supervision of an expert radiologist. Apart from the treatment of ringworm, the usefulness of "X Rays" in diagnosis and treatment has constantly been widening, and an installation at the school clinic often proves of value in other directions.

(5) *Orthopaedic Treatment.* At one or two school clinics in the country, arrangements are now in operation for treatment of certain deformities or incipient deformities by remedial exercises. The possible scope of this treatment is very wide, and its usefulness has now been fully proved. It is certain that, in incipient cases of deformity, the treatment has most effect where, by special exercises in small classes, considerable benefit may be secured for a number at a time. When the deformity is marked, however, the only hope of cure by such means is treatment of the individual child by means of a course which requires much time, with often only a small prospect of improvement. There is, in addition, great difficulty in finding in this country persons of sufficient skill to carry out the work, but this is gradually being overcome.

(6) *Dental Work.* At most school clinics in England, a special dental treatment clinic is arranged.
J. J. B.

CLOAKROOMS.—(See BUILDINGS, SCHOOL.)

CLOUGH, ANNE JEMIMA.—The first Principal of Newnham College, Cambridge; born at Liverpool in 1820; and the sister of the poet, Arthur Hugh Clough. Her childhood was spent chiefly in Charlestown, U.S.A., where her father was in business. She returned to England with her parents in 1836, and at once began her work of education by teaching some girls at Liverpool, to whom, as she said, she wished "to give a knowledge of the world they lived in." This remark is highly characteristic. Miss Clough was always trying to make every one in whom she was interested appreciate life to the utmost, and get all the happiness and interest possible from their own surroundings; and she saw from the first how much happiness was to be had from the right kind of education. In 1852 she set up a small day school at Ambleside, and carried it on herself till 1862. During the next nine years her warm interest in the problem of providing a better education for women, brought her into connection with others who had the same objects in view. In 1866 a society of school mistresses was founded in London, and Miss Clough organized a similar association in Liverpool. In 1867, she, with others, founded the North of England Council for promoting the education of women, and made arrangements for the first course of lectures (afterwards called University Extension Lectures). The Council for some years organized these lectures; it was the Council, too, which induced Cambridge University to establish the examination for women over 18 (now called the Higher Local Examination). When these examinations began, a house was opened for women who wished to study for them at Cambridge, and Miss Clough was asked to take charge of it. She began, in 1871, with five students: as the numbers increased, larger houses became necessary, and the oldest portion of the present college was built in 1875. For twenty-one years, till her death in 1892, Miss Clough watched over the growth of the college, the number of students continually increasing till, in 1892, there were 148. By that time, she had seen many of her desires for women fulfilled and her hopes for them justified. She had seen how full and eager was the response to the chances of instruction opened for them, and to what good purpose they turned the opportunities offered when the university opened the Tripos examinations to women in 1881. Miss Clough may be said to have given her whole strength and time towards bringing a good education within the reach of women whose lives, as she believed, might be in that way filled with happiness and interest, and her belief was confirmed by the whole history of the college (*q.v.*) under her guidance and since her death.
K. STEPHEN.

CLOVESHOO, THE COUNCIL OF.—(See CANON LAW AND EDUCATION.)

CLUBS FOR THE OLD BOYS OF ELEMENTARY SCHOOLS.—The establishment of compulsory continuation education by the Act of 1918 (*q.v.*) must not be considered to solve all the problems involved in the fact that there is a great break between the

school-leaving age of boys and the time when they begin to realize how much they have forgotten, and to wish to make up for lost time and also to obtain further knowledge. The difficulty often experienced, especially in rural districts, where the choice of occupation to boys leaving school is very limited, is whether there is any obvious need for continuing their education. In many cases, too, the home influence does not tend to aid continuation classes; in fact, the keenness for further knowledge is often thwarted by indifferent parents. It is really surprising, even at the present time, the vast number of parents who still look upon the educating and training of boys up to the age of 14 as a great hardship. Again, the reaching of the school-leaving time is felt by the boy to be in itself an important period in his life, a break from school, a time to be looked forward to; and it is some years before boys realize what they have lost and neglected.

The great break in the lad's life when he reaches 14 years of age is therefore, without doubt, a serious problem still, and the question arises as to ways and means whereby the gap can best be filled.

Organization. Much can be done indirectly by means of a social organization. In most secondary schools, and also in some elementary schools, "Old Boys' Clubs" are very successfully managed, the old pupils still keeping in touch with their masters and the world of education. If an old boys' club can be carried on satisfactorily in connection with secondary schools, there is still more reason to expect success for a similar club in connection with an elementary school, because there would be fewer competing attractions, the boys being in most cases drawn from quite a different class of life in which home comforts and privacy might not be so great, the daily life different and possibly more monotonous; while in rural districts there would not be the distractions found in towns. The opportunity of meeting and talking with old playmates, masters, and friends would appeal to the boys, especially in rural neighbourhoods. Most managers and local authorities are only too pleased to further the endeavours of teachers and other public-spirited people of the district whose desires are for the welfare of the lads, and would willingly allow the use of the schoolroom for the meetings of an old boys' club.

Activities. With regard to the conduct of such a club, the social side and the educational part must both be considered. For the former, if an instrument is available, impromptu concerts can be arranged, and also occasional social evenings when friends can be invited. The majority of the boys are naturally shy and reserved; but if once they can be persuaded to take an active part, they soon gain that confidence in themselves the lack of which is so often detrimental to a lad's future career. Most elementary schools now possess a fairly good library, which could be utilized, and in most cases good magazines could be obtained. If the taste for well-chosen books and magazines can be cultivated at all, it can be done at the club and, consequently, in the home; and, if such reading takes the place of some of the cheap periodicals devoured by boys, the time given to the encouragement of a taste for better literature would in itself justify the institution of a boys' club. The club in its social life might also give scope for a gradual training in expression. Discussions and debates on topical subjects can be arranged—and the present period of our history is a specially opportune time.

Although, at first, some difficulty would be experienced in organizing these discussions, owing mainly to lack of self-confidence, by a little tactful help the necessary confidence in themselves would gradually be secured by the lads, who would, after a time, enter into these talks with great zest and skill. The debating evening can be occasionally resolved into a House of Commons and the carrying of a "Bill" through all its stages. The lads could be divided into "Government" and "Opposition," with "Prime Minister," "Speaker," and "Whips." The "Bill" chosen might desirably be one under discussion at the time in Parliament. Another change which would be interesting as well as instructive is a "mock trial." One boy could take the part of a prisoner; other members could take the parts of judge, counsel for the Crown, counsel for the defendant, jury, witnesses, etc. In this way the proceedings of our courts of justice could be followed intelligently. The club might utilize educationally the various boys' hobbies. Most boys have at some time or other taken up a hobby which, in many cases, has been neglected or discontinued for the want of a little help and advice. The meetings of the club would form a very suitable opportunity for stimulating the enjoyment which hobbies afford. Collectors of fossils, eggs, insects, stamps, etc., would also take advantage of the club for exchanges to be made and for seeking advice. Classes could with little difficulty be arranged where such hobbies as fretwork, pokerwork, chip and wood-carving could be assisted or even taught, and sure foundations laid, perhaps, of village industries.

The general character of the club should be social rather than didactic; the training should be mainly incidental and indirect; the utmost scope should be given to the individual tastes of the members, and as much co-operation as possible required from the boys in the actual organization and running of the club. It should not be forgotten that the members are already wage-earners with growing responsibilities, and the club should be made as far as possible self-governing and a training-ground for citizenship.

Those who are willing—some are even anxious—to give up their time to assist such clubs will find themselves amply repaid by the knowledge of the invaluable help thus given to the young generation.

P. PILBEAM.

CLUBS.—(See WORKING GIRLS' CLUBS.)

COACH.—(See TUTOR.)

COACHING.—The application of the term "coach" to a private tutor who prepares adult pupils for examinations originated in Oxford and Cambridge slang, and the coach only supplemented the work of college tutors. The rise of great coaching establishments followed the reform which, in 1854, opened to public competition admission to the military colleges and appointments in the Civil Services. More recently, the system has been greatly developed in preparation for the degrees of London University.

The growth of a great private interest in competition with the public schools and university colleges has inevitably caused friction and ill-feeling. It could obviously have originated only from the absence of satisfactory provision made by those institutions which were first in the field, had

superior equipment, and by their social prestige could influence the conditions of competition. Growth of the private interests could not have continued unless their work had been most ably done. Everything was against them in the conditions which confer gratuitous advertisement and public recognition. As might be expected, these new competitors sometimes adopted objectionable methods of attracting public notice. But they have given solid value for the support they have received, and can afford to rely on undeniable merit.

Criticism and Reply. The accusation brought against them was expressed in a letter addressed, in 1874, to the Civil Service Commissioners by a representative committee with reference to examinations for the Indian Civil Service. It was that they employed methods of preparation "directed solely to obtaining the largest possible number of marks."

As this accusation had reference to an examination, not of boys, in whom the acquisition of knowledge could be tested more easily than the capacity to use it, but of the pick of young Englishmen, it was practically an impeachment of the examiners for incompetence. This point was made in the reply of the then Secretary of the Civil Service Commissioners, Mr. Theodore Walrond. The accusation had been made with evident reference to the head of a famous coaching establishment, that of Mr. Walter Wren. Mr. Walrond observed in reply: "The records of the examinations show that, if there is any difference between the pupils of the establishment referred to and the candidates who come straight from the universities, it is that the former, while they bring up fewer subjects, obtain higher marks than the university candidates in the very subjects which are most studied at the universities, viz., classics and mathematics. And if anyone should be disposed to account for this by saying that these higher marks are not really a proof of superior knowledge, but only of superior skill in deluding the examiners, the Civil Service Commissioners must be content to point to the list hereto annexed of the eminent university scholars and mathematicians who have acted as examiners during the last five years, and to avow their . . . conviction . . . that, with examiners of this high standing, it is utterly impossible that the delusive show of knowledge which is the effect of the process commonly called 'cramming' can ever be successful against real learning and ability."

The controversy was closed by Lord Salisbury in a finding which it would be difficult to question: "The special tutors (the 'crammers') have succeeded in distancing all competitors simply by the excellence of their work. They concentrate high ability upon the attainment of a single result; and this is the secret of excellence in other crafts besides that of tuition."

The Coach as a Teacher. However undesirable may be the creation of private vested interests in education, the same result may be expected to issue from the later phase of the controversy, in which the private teachers have pitted themselves against professional teaching. There is a condition which inevitably tends to bring about this result. On the one side is an organization which makes proved ability to teach an indispensable qualification. In the appointment of professors the question of ability to teach is too often disregarded. The chair is assigned to the candidate who produces the best evidence of capacity to do original work in his subject. In other words, the emoluments of

the professorship are treated as being primarily an endowment of research. The time of a specialist is wasted on work for which he may be unfitted, and the fees of students are paid for benefits which are not adequately provided. In default of a system by which research and teaching might be separately provided for, the student whose immediate interest, though not necessarily his sole interest, is success in preparing for his examination, often finds that he must make independent arrangements.

C. SIMMONS.

COBBETT'S ENGLISH GRAMMAR.—This grammar was written about a hundred years ago by a man who began life as a ploughboy. It was written, too, as he states in his title-page, for "sailors, soldiers, and ploughboys." Ten thousand copies were sold in a few weeks; and it has lately been reprinted by the University of Oxford. The eagerness with which this man studied grammar, and the keenness with which his book was received by men of his own class, furnish a decisive answer to those authorities who have recently maintained that grammar need not be taught in elementary schools. In point of fact, it is more needed in elementary schools than in any others, because the pupils attending these schools are usually in need of some corrective to the bad English spoken in their homes and in the streets.

J. C. N.

COCHIN CHINA, EDUCATION IN.—(See FRENCH COLONIES, EDUCATION IN.)

COCK-FIGHTING IN SCHOOLS.—(See HOLIDAYS IN OLDEN TIMES.)

COCKER'S ARITHMETIC.—This was published, in 1678, three years after Cocker's death, by John Hawkins, a writing-master, and a personal friend of Cocker. Cocker himself taught writing and arithmetic at his school, in St. Paul's Churchyard, about 1657 to 1664; and was known to Pepys, the diarist, who described him as "very ingenious and well-read in all our English poets." He collected a large library of manuscripts and books on science, and also wrote poems; but it is generally thought that the book which bears his name was the work of Hawkins. Besides twenty books on writing, with such titles as *The Pen's Triumph*, *The Pen's Celerity*, Cocker also wrote several books on arithmetic, which appeared before his death. The popularity of the book published by Hawkins made "according to Cocker" a household saying generally interpreted to mean beyond contradiction.

COCKERTON DECISION, THE.—Elementary education is nowhere defined in the Education Acts. "Higher Grade" and "Organized Science" schools had been built and equipped by the larger and more important School Boards; and their curriculum—particularly in science—often reached a stage which we should now think suitable for the middle and upper forms of a municipal secondary school. A challenge and surcharge at an audit of the Local Government Board at length raised the question of legality, and in *Rex v. Cockerton* it was ultimately decided that such schools could not be carried on out of the rates. The Education Act of 1901 regularized the position for the moment, and the Act of 1902 gave general powers of local control and organization which finally ended the difficulty.

A. E. L.

CODE.—Until 1860, the regulations issued by the Education Department had appeared in the form of Minutes. Mr. Robert Lowe combined these into a Code. In 1861, this original code was re-issued as the Revised Code, which re-modelled the system of grant-aid to schools, and introduced "payment by results." It also provided for building grants and grants to training colleges. A New Code became necessary on the passing of the Elementary Education Act of 1870. Subsequent alterations of Education Acts led to necessary changes in the Code. A Code is issued annually, and, since 1904, the changes have been generally confined to minor matters of detail.

CO-EDUCATION.—The case for co-education can be put in a single sentence. If education, rightly conceived and practised, is some day to become one of the chief instruments for perfecting the relations between man and man, then co-education, rightly conceived and practised, will ensure the inclusion in that perfection of the relations between man and woman.

Co-education, rightly conceived, must be the outcome of an educational faith, not of economic or other pressure. It asks, first, that boys and girls, from first to last, shall be educated together by men and women under conditions as far as possible identical (as far, that is, as in any rightly conceived system of education conditions ever can be identical for any two human beings); and it asks in the second place, that, when the conditions must differ, the differences shall be based not on sex but on individuality. Co-education, rightly practised, ensures that in every school-activity—work, play, child-citizenship, child-government—each and all, boys or girls, will be encouraged to take a full share, and to give fully of their best on equal terms, without sex-favour or disfavour.

Arguments for. In the judgment of co-educationists, the result of such conception and practice would be to fit boys and girls more completely for the life they will presently live as men and women, whether the co-operative life of citizenship and public service, or the more intimate co-operative life of love and parenthood. Each sex would set a higher value on the capacity and understanding and serviceableness of the other; boys, in general, would be less cruel and less unclean; girls, in general, less dependent and less sentimental. Others, it is true, hold that the results would be very different. Girls, it is said, will make boys sentimental; boys will make girls rough and clumsy; and each will make the other, at the worst, immodest and prurient, at the best, prematurely love-sick. And, even apart from these "dangers" (of which, however, many avowed opponents have no fear), there is urged the further fundamental objection that, since the sexes differ no less in mental and moral qualities and capacities than in physical, true education, which must be fitted to the child (not the child to it), cannot possibly be the same in detail for both boys and girls, however similar in outline. This last contention would be final, if it were convincing. But against it there may be urged the following considerations. In the first place, conditions in co-education schools are no more necessarily the same in detail for sex than they are for age or physique or capacity. Within the limits of curriculum and time-table and ideal—each ceaselessly broadening—every child, boy or girl, engages in the activities,

and takes the place in the school, for which it is best individually fitted. And disciplinary methods having equally broadened, shortcomings and excesses are treated at least as individually as a physician's patients.

In the second place, the likenesses between men and women, boys and girls, are of infinitely more significance than the differences. Great differences there are, of course—and happily such as are vital to our happiness cannot yet be bred or educated out of us—but the great likenesses are vital also. Are we not "fed with the same food, warmed and cooled by the same winter and summer?" As for the few minor differences that do justify some special treatment, they are no greater than the differences between individuals of the same sex, and may be left, as those individual differences are always left, to the wisdom of the individual educator.

In the third place, the education of Nature, that "good old nurse," and of Life, that good old schoolmaster, is, in spite of all our differences, major and minor, the same for us all. Mountain and lake, war and treachery may affect us differently; they probably do not indeed affect any two individuals in exactly the same way. But we do not divide into sex-groups to study them, or to be influenced by them. Nor are any of the great things of the spirit planned and psychologically elaborated for man or woman alone. Books, music, religion, and all art; economics, ethics, politics, and all science—these are our common heritage and our common field of labour.

In the fourth place, education is greater than instruction, greater than specialization. It is, rather, universalization, a steeping of the individual, that is, in all the common elements of noble and beautiful life—thought, work, play, service, justice, friendship, love. In none of these common elements has either sex a monopoly. In all, if they are to be at their best, are both sexes essential. Why, then, should we rob each of so precious a complement?

Arguments against. Of the so-called dangers, we need have no fear. There is a sense in which it would be good for many boys to be touched with girlish sentiment, and for many girls to catch something of boyish roughness. As to immodesty and pruriency—and worse—they certainly already exist in full measure in the large majority of schools, whether for boys or for girls. Co-education alone will not entirely destroy them, but the more wholesome two-sexed atmosphere inside the school is bound later to have its effect outside.

Co-education is, in short, one of the chief antidotes to what may be called the poison of sex. Another is sex-education, the first step in which is the frank recognition of sex by all educators as an element in human circumstance no less essential, no less discussable, no less beautiful, no less sacred, than the religious element itself. Of that frank recognition, co-education is an all-important part.

But many who are unafraid of these graver things still fear that, under the influence of co-education, there will be many instances of premature love-sickness, and a consequent diminution of interest in and application to things academic.

That school-friendships would often be irradiated with sex cannot be doubted, such irradiation of friendship being one of the inevitable glories of our lives. And if the attachment were comely and open (as boy and girl attachments under the old conditions so often are not), and no gibes were uttered

and no mental paralysis ensued, it could only make for the individual and the communal good. But it cannot be doubted either that, in certain cases (experience shows them to be few) a quite open love-obsession might seriously endanger a career, if not a character. The degree of damage would depend upon the degree of wisdom with which the situation was handled by school and home. Such a love might even be turned to advantage as a stimulus, as it so often is (and as it is always expected to be) in the big world. But even at their worst, such school attachments are no reflection on co-education. In the first place, they have been known to happen (generally secretly and probably, therefore, more seriously) to other than school-fellows; and, in the second place, no human system has ever produced, or will ever produce, perfection. Our failures are part of the price of our successes, and we must be content to pay. But though we may be content to pay the price, the payment is largely waste, unless our failures teach us better. It is the conspicuous failure of separate education in all matters of sex that calls for co-education, just as it is the failure of education for war that is now calling for education for peace.

Conclusions. What security is there that co-education will not also fail? None. But there is already much evidence in England (where it is comparatively new) as to the easy good-comradeship of co-educated boys and girls, both in school-life and after-life. In spite of such immediate gain, however, it must be admitted that even where it has been tried for generations and on a large scale (as in Scotland and America), it has not yet cured society of all its sex-troubles. But that is partly because it has seldom been genuine co-education, and partly because it is only one of the antidotes. The whole is greater than the part; and education itself must be re-shaped, re-inspired, before co-education can have full effect.

On the other hand, so far as can be ascertained, none of the predictions of evil have been fulfilled. Disappointments here and there, doubtless; but no crop of disaster. Meanwhile, faith in co-education is slowly strengthening and spreading, and, in the new and broader conception of education which is slowly forming, it is destined, many believe, to take a foremost place. And this will be well, for, tragically unsuccessful as have always been, and still are, all our efforts to establish peace and good will upon the earth, the most tragic of all our failures has been the failure between the sexes.

J. RUSSELL.

COGAN'S SCHOOL.—(See NONCONFORMIST EDUCATION OF THE MIDDLE AND WORKING CLASSES.)

COIMBRA, UNIVERSITY OF.—(See PORTUGAL, EDUCATIONAL SYSTEM OF.)

COLET, JOHN (1466–1519).—An Oxford scholar, who studied in Italy, and to whom was due the "awakening of a rational Christianity" in England (J. R. Green). He pursued the study of Greek literature as a means of understanding the Gospels and the rest of the New Testament. In the later years of Henry VII, Colet lectured at Oxford on the Epistles of St. Paul, and at this time numbered among his friends and admirers a group of scholars which included Erasmus and Sir Thomas More.

In 1506 he was appointed Dean of St. Paul's, London; and became the greatest preacher of the

day. He was anxious for educational reform, and took advantage of his office to found a grammar school beside St. Paul's Cathedral, where all his educational plans could be carried out. New methods of instruction were introduced, and Erasmus wrote text-books for the use of the school. Rational religious teaching was combined with sound logic and a steady diffusion of Latin and Greek literature. The example of Colet, though much opposed by the unprogressive clergy, was widely followed, and in the last few years of Henry's reign many grammar schools were established.

The first head master of Colet's School was William Lyly, an Oxford scholar, who had studied in the East, and who shared with Grocyn and Linacre (*qq.v.*) the honour of being one of the earliest Greek scholars in this country.

COLLECTIVE CONSCIOUSNESS.—It is a well-known fact that when large bodies of people act together, their individual mental processes become modified in such a way that they tend to act as members of a group or social unit, rather than as separate individuals. The uniformity of the actions of crowds is so marked, that many observers consider we have a right to assume the development of a collective mind. Others suggest that collective action always tends to be more primitive than individual action. Historic cases, such as the French Revolution crowds, certainly show that a mass of people will perform actions which would be abhorrent to the majority of the individuals forming the crowd.

The explanation of collective consciousness is worthy of deep study, and the subject already forms a branch of social psychology. Probably the gregarious instinct and the instinct of imitation form the basis of the crowd-mind. (See CLASS PSYCHOLOGY.) The processes involved in hypnotism and auto-hypnotism also play a part. Telepathy is not yet an approved scientific fact, but there is a growing mass of evidence towards such proof, and this will go far to explain the peculiar properties of the emotional sympathy of the collective mind.

M. J. R.

COLLECTIVE PSYCHOLOGY.—(See SOCIAL PSYCHOLOGY.)

COLLECTIVE WILL.—A result of man's being a social animal. By association, the members of a corporate body attain a community of interest, and mutual sympathy leads them to a community of will and of action.

COLLEGE (Fr. *collège*, Lat. *collegium*).—In Rome, from ancient times, existed corporations known as *collegia*, established for various ends. Guilds of artisans, bodies of persons associated for religious worship, and persons who combined for mutual assistance, formed what in Rome was known as a *collegium*. This original meaning still survives in such titles as the College of Physicians and the Royal College of Surgeons. In Rome, also, certain official bodies bore the title, as the College of Tribunes and the College of Auggurs. In the Roman Church there is the College of Cardinals, or the Sacred College; and in this country we have a College of Heralds and a College of Bishops.

Collegiate Church. In the Middle Ages the word underwent a restriction of meaning, and came to denote a community or corporation of secular

clergy living together for religious service. The church supported on their endowment was known as a "collegiate" church, because the college of clergy performed its ecclesiastical services. In later times, the name collegiate church has been applied to a church connected with an educational institution. As was customary in the Middle Ages, a college established on a foundation was required to undertake charitable work, such as the charge of an almshouse, a hospital, or a school. For this reason the word "college" came to be connected with an establishment whose chief object was education. The early educational foundations at Oxford were named simply "domus" or "aula," as was the case with Balliol and Merton Colleges; but from the fourteenth century the word "college" came into use, and New College was founded in 1379.

Definition of College. In educational history a college is generally a self-governing society of scholars formed for purposes of study and instruction, and often connected with a university, as in the case of the Colleges of Oxford and Cambridge. In some cases, the college and the university are one and the same; this is of frequent occurrence in America, where many small institutions have assumed the name of university. The proper meaning of the term is an institution for higher general, not professional, learning, where university degrees are granted to students after a regular course of study. But, in addition to colleges thus defined, the name has been adopted by a wide range of educational institutions, including training colleges for teachers; law, medical, and technical schools; divinity schools; and also by many small and insignificant private adventure schools for children.

Oxford and Cambridge Colleges. At the Universities of Oxford and Cambridge the distinctive feature of the educational system is the college. In this respect these universities differ from those of any other country. Each college is a distinct and independent corporation, managing its own property and choosing its own officers. The University has no legal power over a college, though it has certain jurisdiction over a student because he is a member of the University. Expulsion from a College does not necessarily involve expulsion from the University; and, if the University expelled a man, he might still continue to be a member of his College. The connecting link between College and University is the monopoly of the latter of the power of granting degrees. The University appoints professors, each College has its own tutors and lecturers, and the greater part of the education of students is carried out by the tutors and lecturers.

Educational Colleges. The origin of educational colleges belongs to the Middle Ages, when students flocked in thousands to the famous university towns. Writers have stated that at Paris there were 30,000 and at Oxford 20,000 such students at a time. Stripped of exaggeration, the numbers were doubtless very large, and led to the foundation of "houses (*domus*) of scholars." In Paris, academic cloisters were specially planned for the education of secular clergy, the most famous being the College of the Sorbonne, founded about 1257 for a small number of students of theology. The Sorbonne College became so notable that in later centuries it stood for the whole theological faculty of the University of Paris. Balliol, the first Oxford college, was founded, in 1261, on the model of the Paris houses.

Walter de Merton, the founder of Merton College, Oxford, began the English college system. At Merton, students commenced with the study of the arts and afterwards proceeded to theology, and young boys of twelve years were admitted to be instructed in grammar before proceeding to the arts.

The development of these new colleges was greatly assisted by the Dominican and Franciscan friars, who opened many houses of study in great cities and university towns during the thirteenth century.

William of Wykeham opened the first college outside a university town when he established Winchester College in 1379. His example was followed by Henry VI at Eton, and since the Reformation many of the great public schools have held the title of college.

In German universities, the colleges were primarily intended for the teachers; and the students were established in hostels, which were mere lodging-houses.

At Louvain and other universities in the Netherlands, the colleges were more like those in England, though at present there is no exact equivalent upon the Continent of the English colleges.

COLLEGE, THE AMERICAN.—(See UNITED STATES, COLLEGES AND UNIVERSITIES OF THE.)

COLLEGE OF PRECEPTORS.—(See PRECEPTORS, THE COLLEGE OF.)

COLLEGIATE CHURCH SCHOOLS. (See COLLEGE.)—A collegiate church is one whose members form a college or chapter, and is established on the model of the cathedral churches. The collegiate canons have rights and duties similar to those of the cathedral chapters, but have no voice in diocesan management. These colleges are almost as ancient as the cathedrals and, like the latter, they set up schools from a very early period. Among the earliest were the collegiate churches of Ripon and Southwell, and the school at Ripon is one of the few that still remain. Other well-known schools at Derby and Warwick still exist on the original endowments; while those at Leicester and Bedford obtained new endowments after the dissolution of the monasteries, which closed the majority of the collegiate schools.

COLLEGIATE SCHOOLS AND CHURCHES.—(See ENGLISH SCHOOLS TO EDWARD VI, HISTORY OF.)

COLLOQUIES (or dialogues).—These constitute an important chapter in the history of education. They bear witness to the earlier form of oral rather than written methods of teaching. Their obvious defect is that the more successful they are, the more they tend to stereotype the particular instruction given through them. Instead of the pupil actively thinking out his own speech, he has his own response provided for him, and his mental activity may readily be limited to memorizing. Even if this be so, the advocates of the use of colloquies maintained that a vocabulary was pleasantly and intelligently acquired. The colloquy, dating back to the times of the Romans, shows the learning of Greek by Greek-speaking as the method in vogue; and, in England, the colloquy goes back at least as far as Ælfric, in the tenth century, as a method for the learning of Latin by conversations given in both Anglo-Saxon and Latin.

Historically, the colloquy flourished most prominently in and after the Renaissance. (See LATIN, HISTORY OF TEACHING OF.) The *Manuale Scholarium* appears to date from about A.D. 1480, and was in general use in the German universities. It is, of course, mediaeval in atmosphere, and its Latin is weak. In its subject-matter, the *Manuale* contains a description of the academic procedure of the times. The old Colloquies for teaching Latin are now of particular value for tracing the general surroundings of school life and school methods from the fifteenth century onwards. Other colloquy-writers have their local interest. But the greatest writers of colloquies were Erasmus, J. L. Vives, and Maturin Corderius. These dialogues present the spontaneous utterance put into schoolboys' mouths on the subjects of most interest at the time. Thus, Erasmus (*Colloquies*, 1519) writes on civility and manners, on school-play and various games, on hunting, on school studies, even on writing and against barbarous Latin; but he also speaks freely against monks, superstitions, tyranny, and the corruptions of the age. J. L. Vives, with more adaptability to the age of schoolboys, in his *Exercitatio* (1539), writes on the home-life of boys, going to school, children's play, school meals, school travels, a new house, the school, night-studies, the kitchen, the king's palace. He provides the first Renaissance dialogue on temperance, and advocates water-drinking as against intoxicants; and writes one dialogue on the education of princes. Through such work the religious side of the Northern Renaissance was emphasized. Later, in 1564, the *Colloquia* of Maturin Cordier (Corderius) intensified the Puritanic side of religion, and dealt faithfully with his Genevan schoolboys in impressing on them the desirability of correct Latin and the sense of a real theocracy. Thus the will of God is cited as ruling in all the events, trivial and critical, in the child's life. In all purposes, he must say "If the Lord will." The Puritan atmosphere as it affected the child can nowhere be better studied than in these *Colloquia* and those of Castellio (*q.v.*). This text-book was in almost universal use in English schools in the seventeenth century. In the eighteenth and nineteenth centuries, the dialogue was specially applied to scientific and intellectual subjects, and later by William Ellis (*q.v.*) in the teaching of ethical, social, and economic subjects. F. W.

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COLOMBIA, THE EDUCATIONAL SYSTEM OF.

—The Republic of Colombia cannot claim to have an educational system of its own. In this connection, as in practically all other national administrative activities, Colombia, as well as the other Latin-American States, have had a great deal to learn from Europe and from the United States. Spanish influence in the field of instruction was limited to higher education (but even this was too classical), and greatly handicapped by the enormous distance which, in Colonial days, separated the country from the more advanced European centres. As to

public schools, there were practically none, the prejudices of the mother country against the enlightenment of the masses being then too strong.

The policy of the Spanish Government during the two and a half centuries or more which elapsed from the time the Conquistadores set foot on the Continent until the fight for liberty began, was that of placing a college education within reach only of the well-to-do, or of those otherwise singled out to be so favoured. But as for the sons of very poor or of middle class men, whether *criollos* (natives) or of pure Castilian blood, they had but seldom, if ever, the chance of an elementary education.

Early History. It was in early Colonial days that a Dominican friar, Cristobal de Torres, founded at Santa Fè de Bogotá, capital city of the Nuevo Reino de Granada, the well-known Colegio Mayor de Nuestra Señora del Rosario, which became the *Alma Mater* of a number of the patriots who promoted the War of Liberation. But the educational programme at this particular establishment, and at similar institutions, can be easily surmised when one remembers that no books were printed in Colombia at that time, and that the very few which occasionally fell into the hands of those anxious for a wider information, were only allowed into the country after the most vigilant and strict censorship by the Spanish Inquisition.

Nineteenth-Century Tendencies. The War of Liberation began in 1810 and, although fighting in Colombian territory may be said to have ceased in 1819, the struggle for independence in that part of the South American Continent did not come to an end until 1824.

The war over, there came a period of reconstruction, and education was naturally one of the questions to which the leading liberal-minded men of the day gave their first thought. Unfortunately, however, two opposed tendencies in the educational system divided public opinion—influenced on the one side by Spanish tradition and methods, and on the other by the ideals of the French Revolution. The struggle between these two contrary tendencies, far from abating, became more and more bitter as the years went by. The educational systems of the two contending groups finally came to be part and parcel of the programmes of political parties, which, when in power, introduced radical changes in the educational policy followed by their opponents. Unfortunately, too, religious sentiment was made to play a very important rôle in this controversy.

In early republican days, President Santander did his utmost to lay the foundations of future national education—he, as well as those who assisted him in this effort, being aware of the fact that Colombia's freedom would not be complete until and unless the country would obtain the emancipation of its soul, as a sequel to its political liberty. This was also the policy of Murillo Toro, twice President of the Republic.

President Acosta, in 1867, inaugurated what was known for eighteen years as the Colombian National University, where students could obtain their first degree, and their qualifications in Law, Medicine, and Engineering. The College of Nuestra Señora del Rosario also qualified its pupils for the Baccalaureate and the Law. The system followed at both institutions during that period of eighteen years was practically European, and from their lecture-halls emerged two generations of brilliant and

capable men. This is equally true of some of the private colleges established in the country, of which the most famous was one under the management of Dr. Lorenzo M. Lléras, who at one time was Colombia's Foreign Minister. Another was conducted by Dr. Santiago Pérez, who devoted all his energies to educational activities before his elevation to the Presidency of the Republic, as well as after his period of office terminated; and last, but not least, there was the college of Dr. Concha, father of the present President of Colombia.

During this short period, the sons of rich and poor alike received the same primary instruction; and the liberal ideal of public instruction, gratuitous and compulsory, was near realization. However, the political reaction which took place during President Nuñez' administration effected the most complete change in everything, and public instruction experienced a great set-back. The National University came to grief, and its main building was given to the Jesuits who, henceforth, would rule the elementary branch of the establishment. For many years after this, the appointment of professors was governed by the principle of exclusiveness, the selection always being made from amongst the friends of the Government. The College of El Rosario, which had so far enjoyed autonomy and self-government, was deprived of them, and its President was no longer elected by the students, but by the Executive.

Modern Developments. This state of affairs lasted for a quarter of a century, up to the year 1909; and if, during this period, there was any progress in higher education, it was mainly due to the efforts of a few professors who established some private colleges. Amongst these should be mentioned El Externado, under Dr. Nicolas Pinzón Wallis, El Colegio Academico of Professor Rueda, Araujo's College, and the Universidad Republicana. If the present educational systems leave much to be desired, exclusiveness is no longer the rule, but the exception; and closer intercourse with the outside world is gradually influencing that system.

Administration and Scope. The Budget for 1915 set aside \$1,300,933.50 (£260,187) for the year's expenses at the Ministry of Public Instruction. This amount included the salaries of the *personnel* of that office; the endowments to the Academy of History, the National Library, and National Museum; the expenditure on industrial and professional instruction; scholarships; the salaries of teachers, male and female, of primary schools in the Republic; and a few endowments to charitable institutions.

The Primary School teachers are qualified at the Normal Schools, of which there are twenty-nine. The number of pupils at these schools is about 1,700, of which 60 per cent. receive their education free. The salaries of the teachers of both sexes vary between £70 and £150 per annum, and it is generally conceded that in most cases the pay is quite inadequate. There is a Preparatory School annexed to each Normal School. In the opinion of the present Minister of Public Instruction, the system now followed at the Normal Schools leaves much to be desired. He points out that the number of teachers is insufficient, and another drawback to the efficient work of these Normal Schools is their lack of proper buildings. These schools are under the management of one principal and a Central Board; and there is an Inspector of Public Instruction in every department of the Republic.

In the matter of Technical and Commercial Education, reference must be made to the National School of Commerce which exists at Bogota, the capital city of Colombia, which was attended by 520 students in 1914. No less than £1,400 have recently been expended to provide this institution with laboratories and other pedagogical equipment. There are also at Bogota two Central Normal Schools, the only ones enjoying the privilege of granting qualifications to teachers enabling them to fill the post of Principals of Normal Schools. One of these Central Schools is for men, and the other for women; and the total number of students is about 150. There are several Technical Schools in the country, and manual work is taught in them. Special mention must be made of the Salesian School at Bogota, where a number of poorer boys receive tuition in printing, binding, carpentry, ironmongery, cabinet work, and other useful occupations.

As to the curricula, they are practically the same for all Primary and Normal Schools. Every day, except Sunday, is a school day in Colombia; but the number of religious feast days reduces considerably the time devoted to education. The work begins about 8 a.m., and, with the exception of one hour for lunch, it does not stop until about 5 p.m. Formerly, no attention was given to physical exercise, but some time is now devoted to sports, particularly to football, which has been recently introduced. At the Primary Schools, the curriculum includes elementary tuition in grammar, national history, civics, arithmetic, spelling, geography, religion (Catholic), reading, and writing. In the matter of professional education, special mention must be made of the faculties of medicine and engineering, which are most efficient and a credit to the nation.

E. PEREZ.

COLONIAL APPOINTMENTS, EDUCATION FOR.—(See PUBLIC SERVICES, EDUCATION FOR HIGHER.)

COLONIAL INSTITUTE, THE ROYAL.—The Colonial Society was formed in 1868 as a non-sectarian and non-political organization for the purpose of stimulating the loyalty of Britons towards the Empire. Its mission was to foster among all dwellers in British territories beyond the seas a love for the Motherland, and to cultivate in their hearts the feeling that they were British citizens so long as their homes were under the British flag.

The Society was formed by a meeting in Willis's Rooms (London), under the presidency of Viscount Bury, of influential representatives of Colonial interests and members of the Legislature acquainted with Colonial questions. No party considerations were allowed to enter into the Society's purpose, and the approval of both great parties was secured at once. In 1868, members of a Conservative Government assisted the Society with their presence and speeches; and in 1869 the Liberal Government and Mr. W. E. Gladstone himself gave the same support. In 1869 the name was changed to Royal Colonial Institute, and in 1882 a royal charter was granted by Queen Victoria.

From the first, the Society had been impressed with the national importance of imparting to the rising generation, full and accurate knowledge of the nature and extent of the British Dominions and their resources, and it has not ceased to urge

upon education authorities and other public bodies the need for giving greater prominence in all schools to teaching the history and the geography of the British Empire. The Oversea Dominions are the natural outlet for our surplus population and capital; and the Institute has now committees dealing with India, Empire Migration, and Empire trade and industry. The Imperial Studies Committee promotes the teaching of facts bearing on the resources, trade, history, and development of the Empire; and provides lectures, both scientific and popular, to assist such teaching.

By its own first rule, the objects of the Institute are to provide means whereby persons interested in Colonial and Empire affairs may meet together; to establish a reading-room, an up-to-date library, and a museum illustrative of Empire life; to promote interchange of experiences, the reading of papers, discussions, and investigations in connection with the Empire.

The Society consists of Fellows, resident in England or non-resident, who are elected after nomination by two Fellows. Every Fellow receives a copy of the magazine, *United Empire*, issued by the Institute each month; and has free use of library and reading-rooms. There are also Associates, gentlemen and ladies, who are elected on nomination by one Fellow or Associate, and pay an annual subscription, but no entrance fee.

Work of the Institute. In 1883 a permanent building was opened in Northumberland Avenue, London, W.C.2, as the home of the Institute, and to accommodate official rooms, library, reading-room, and newspaper room.

The library now contains upwards of 140,000 volumes, etc., dealing chiefly with the history, government, trade, and resources of the British Dominions. The newspaper room contains copies of over 800 journals, magazines, and reviews collected from all parts of the Empire. Books may be borrowed from the library by Fellows. The library is open from 9.30 a.m. to 8 p.m.

The *Proceedings of the Society* were published from 1869 to 1909, and collected in annual volumes. In 1890 a new publication, the *Monthly Journal*, was commenced. In 1909 appeared the first monthly part of *United Empire*, which took the place of the *Proceedings* and *Monthly Journal*. The annual volume of about 1,000 pages contains maps, illustrations, diagrams, copies of papers read at the Institute, articles contributed by recognized authorities, reviews of books and information on trade. Copies are sent by the Institute to many clubs and institutions.

The Institute awards a gold medal annually for the best research monograph on some subject of Colonial importance, and the winner also receives a prize of a hundred guineas and is made an honorary Life Fellow.

Prizes in books and medals are given for essays on Empire subjects, and are open to pupils of recognized schools in the United Kingdom and overseas, of ages below and above sixteen years.

Education outside London is promoted by the establishment of local committees and local branches (which work on the same lines as the parent body). Help is given by the Institute by the provision of illustrated Empire lectures, with an experienced lecturer and a fine collection of lantern slides.

The *Year Book*, publication of which is at present suspended, was formerly supplied free to members and sold to the public, and contained in a handy form

a fund of information on the objects, work, and development of the Institute.

COLOUR BLINDNESS.—A defect of vision which prevents some persons from being able to distinguish certain colours correctly. It was first described by Dalton, the chemist (1794), who suffered from it. In total colour blindness there is no perception of colours, but only of variations in light and shade. In other cases there is a complete inability to distinguish some bright colours, while others are perceived correctly. In milder cases, there is only an inability to distinguish shades of difference in individual colours. The colours which usually cause difficulty are red and green, but rarely blue and yellow. About one man in twenty-five is to some extent colour blind, and about one woman in 200. (See also COLOUR VISION, THEORIES OF.)

COLOUR VISION, THEORIES OF.—Colour depends upon the length of the light waves in the ether. A colourless sensation can be obtained by combining all the spectral colours, or by combining the primary colours red, green, and violet in certain proportions. It is also possible to produce any colour sensation by mixing these together or with black and white. Every colour has its complementary colour, which, if mixed with it in the right proportion, produces a colourless sensation.

After Images and Contrast Colour. If a patch of colour be fixated and the eyes then turned to a blank wall, an image of the patch will appear either with the colour of the original (positive after-image) or the complementary colour (negative after-image). Again, if a patch of red be fixated on a white background, the white will appear to bear a greenish tinge (contrast colour).

Colour Blindness. There are three main types of colour blindness: red-green blindness, in which the individual confuses red and green; yellow-blue blindness; and total colour blindness.

Theories of Colour Vision. The two chief theories of colour vision—the Young-Helmholtz theory and Hering's theory—have been much criticized and modified by later views, but no comprehensive theory has yet been advanced to replace them.

The Young-Helmholtz theory presupposes three standard colours, which produce coloured or colourless sensations when mixed in different proportions. Three sets of visual apparatus are supposed to exist in the retina, which make use of special photo-chemical substances. The first apparatus is most sensitive to red, the second to green, and the third to ultramarine blue. All are stimulated, but in different degrees, and hence different colour sensations are produced. High stimulation of all three causes a sensation of white; black is due to a total absence of stimuli.

Hering's Theory is based on the fact that certain colours—red, yellow, green, blue, together with black and white—appear to be more elementary than others. Hering assumes that three visual systems exist, and also that complementary colours produce opposite effects. Stimulation of the first system gives rise to the sensations of red or green, produced by assimilation or dissimulation of a photo-chemical substance. Stimulation of the other systems produce sensations of blue or yellow, and white or black respectively. Hering regards black as a positive sensation.

Both the Young-Helmholtz and the Hering theories regard the absence of one set of visual apparatus as an explanation of partial colour blindness, but evidence has been obtained which appears to contradict this view. Helmholtz explains negative after-images as due to fatigue of the special apparatus affected, while Hering states that the positive after-image produced by closing the eyes after gazing at a bright object is due to exhaustion of the assimilation material during fixation.

Many physiologists find it difficult to regard black-and-white sensations as produced by the same type of stimulus as red-green and yellow-blue.
M. J. R.

COLUMBIA COLLEGE, NEW YORK.—(See UNITED STATES, COLLEGES AND UNIVERSITIES OF THE.)

COLUMBUS, FERDINAND.—(See CLENARD.)

COMBE, GEORGE (1788–1858).—He was born at Edinburgh, and is generally known as the phrenologist and author of the *Constitution of Man*. His educational work, of enduring value, is not so well known as his philosophical work. In early life he showed a decided leaning to mental studies, and came under the influence of Spurzheim, who visited Edinburgh in 1816. From that time he was convinced that the one work of his life was the study of mental phenomena based on physiology, and the practical application of the philosophy thus created. In 1819 he published *Essays on Phrenology*; in 1822, *A System of Phrenology*; and, in 1828, his great work, *The Constitution of Man*. From 1828 his educational labours were unrenitting both by speech and by writing. In 1838 he visited America and lectured on education, and for a period he contributed educational articles to *The Scotsman*. He was an earnest worker in the establishment of infants' schools throughout this country and in America. He assisted in inducing Wilderspin to visit Edinburgh in 1829, and was one of the original founders of the Edinburgh Model Infant School Society, and of the first infant school in Edinburgh. Combe earnestly recommended Wilderspin's methods, and did much to promote the spread of infant schools throughout Scotland. In 1831 he began to lecture in various parts of the country on education as illumined by phrenology. In 1835 he took a share in the foundation of "The Edinburgh Society for the Diffusion of Moral and Economical Knowledge." He was an advocate of secular education in public schools, and to advance his views published pamphlets on *The Relation between Science and Religion and What should Secular Education Embrace?* (1847–48). In 1848 he opened a "Secular School" in Edinburgh, where the moral and religious faculties were carefully trained, but from which doctrinal teaching was excluded. This school existed until 1854, and was a decided success.

COMBINATION METHOD OF DEAF TEACHING.

—(See DEAF-MUTISM AND EDUCATION.)

COMENIUS, JOHN AMOS (or KOMINSKY) (1592–1670).—Was "the father of modern educational method." He advocated the education of girls and women ["for equally are they God's image; . . . equally are they furnished with minds agile and capable of wisdom, yea, often beyond our sex"]. He demanded education for all, rich and poor. "We design for all who have been born human beings, general instruction to

fit them for everything human. . . ." In addition to suggesting universal (including girls') education, Comenius named the four types of schools necessary for a national system, viz.: (1) The School of Infancy, up to the age of 6 years; (2) the School of the Mother-tongue, from 6 years to 12 years; (3) the Latin School, from 12 to 18 years; (4) the University, from 18 to 24 years. He thus is the pioneer of modern national educational systems—for these divisions roughly correspond with our kindergarten, elementary, secondary, and college divisions. He is an encyclopaedist, because he wishes to build up a man by education, by knowledge "of all things"; secondly, by the inculcation and practice of virtue; and, thirdly, by religion. His great work on educational theory is entitled the *Great Didactic (Didactica Magna)*; it aims at "setting forth the whole art of teaching all things to all men." It was projected in 1628. It was first written in Czech. It was then translated into Latin, and published at Amsterdam, nearly thirty years later, viz., in 1657.

The Text-books of Comenius. Yet, in spite of these great claims to a high place in the history of education, Comenius is, perhaps, best known by his practical efforts to simplify the text-books for teaching purposes. He desired these text-books to combine the double aim of teaching useful subject-matter in the vernacular, and of teaching, in a parallel column, the Latin rendering of the vernacular; and suggested further parallel columns in which would be included other languages, ancient and modern. His books, therefore, were intended to be bi-lingual, tri-lingual, and, indeed, multi-lingual. He expected the pupil to speak each language he learned.

The *Janua Linguarum* was published in 1631. It was based upon the *Janua Linguarum* (c. 1605) of the Society of Jesus, compiled by William Bathe (Bateus) (1564–1614), an Irish Jesuit, who belonged to the Irish College at Salamanca, in Spain. Bathe's *Janua* included all the common root-words in the Latin language, and he ingeniously divided them into 1,200 short sentences in the form of maxims (e.g. "Repentance is the companion of a rash judgment"). Bathe's original work was published in 1611, in the Latin, and a parallel column of Spanish; though, afterwards, in England, a Latin-English edition was published (1615) by William Wilde, and, in 1626, by John Harmor, head master of St. Albans School. From the Jesuits' *Janua*, therefore, Comenius got the idea of a complete Latin vocabulary. Bathe only used the same Latin word *once*, and thus a number of his 1,200 sentences were very poor and valueless in meaning. Comenius was intent, in his *Janua Linguarum*, on making every sentence in his work full of useful knowledge. In this aspect of his book, he was not following the Jesuits' *Janua*, but the "Nomenclators" of the time, particularly that of Hadrian Janius, who had ransacked 311 Latin and Greek authors to find the names of material things for his *Nomenclator*, or *Remembrancer*, as the English translation is called by the translator, John Higgins, in 1588. This gave what Comenius wanted, the *names of things* in encyclopaedic detail. In the *Nomenclator*, there are chapters on 89 different subjects, whilst in Comenius's *Janua Linguarum* there are 100. Many of the subjects are common to the two works (e.g. living nations, animals, fishes, all kinds of food, trees, vegetables, apparel, buildings, parts of ships, tools, terms in war, games, money, the elements, God and spirits, handicrafts, trades,

names of kindred, etc.) Latin names for every conceivable thing are included—not necessarily classical—still, apparently based on some authority: classical, mediaeval, or neo-Latin. Altogether, Comenius got together, it is computed, some 8,000 Latin words, and, as an ordinary Englishman is said to use ordinarily not more than 3,000 to 5,000, the schoolboy who knew all the words in the *Janua* was equipped for talking about all useful subjects. There was information in the various chapters on the elements of all the arts and all the sciences, and, no doubt, Comenius expected the teacher also to give supplementary knowledge. Each chapter was to be studied ten times. Thus "pansophic" or encyclopaedic knowledge was to be acquired, along with the study of the vernacular, Latin, and other languages. The success of the book is shown by translations into twelve European languages, as well as into Arabic, Turkish, Persian, and "Mongolian," spoken throughout the East Indies. In 1633, Comenius published a fuller form of the *Janua*, which he called the *Atrium*; and, later, the *Vestibulum*, which was to be a Latin primer, to be used *before* the *Janua* was attempted. It should be stated that the *Janua* was to contain a grammar and dictionary for the Latin language.

Comenius is remarkable in his readiness to alter, for the better, books with which a less enthusiastic man would have been satisfied on account of their undoubted success. He had been impressed by certain suggestions which had been made by Eilhard Lubinus in a preface to a Greek Testament (in three languages), viz., for a text-book which should contain *pictures* of objects, with the Latin names given, with short descriptions of the illustrations, so that the Latin names would be more easily remembered. Comenius thus devised an illustrated first Latin book for children, for which Michael Endter, of Nuremberg, sympathetically engraved the cuts in copper. The book was called the *Orbis pictus*, which was intended to serve the purpose of introducing the child to the "visible world." It was a logical conclusion to the stress laid upon observation through the senses, and establishes Comenius as a follower of Bacon and as a sense-educationalist. Bibliographically, the *Orbis pictus* is a simplification of the *Janua Linguarum*. It was published at Nuremberg in 1657, and appeared in an English translation by Charles Hoole (*q.v.*) in 1658. The central point about the *Orbis pictus* is Comenius's desire to adapt his methods of teaching to the actual words, not of the subject-matter, but to the interest of the child. This is further seen in his school-plays, especially the *Schola Ludus* (1657), or *Encyclopaedia viva*, in which objects taken from the whole round of Nature were represented "to the life" by children-actors. Finally, as a semi-educational work, Comenius wrote a religious romance, *The Labyrinth of the World and the Paradise of the Heart*. The parallel between this work and that of John Bunyan's *Pilgrim's Progress* has been pointed out, but there is no question of influence of the one on the other, since Comenius's work was written in Czech, and there was no translation of it into English until that of Count Lutzow in A.D. 1900. But Comenius's own life was a religious romance, and he may well be regarded as his own mystic Pilgrim winding his way through the Labyrinth of the World to the Paradise of the Heart. As an educationist, he was permeated with the inculcation of the religious life.

Biography. He was born at or near Ungarisch-Brad, in Moravia, in 1592, where his early school experiences were unhappy. His later school was at Prerau (1608–1611), under the Moravian Brethren. In 1611, he went to the University of Herborn, in Nassau. He then came under the influence of John Henry Alsted, who wrote the well-known *Encyclopaedia of the Sciences*. In 1613 Comenius studied at Heidelberg and, in 1614, he went back to Prerau as a teacher. In 1616 he was ordained as a minister of the Moravian Brethren, and, concurrently, was schools-superintendent at Fulneck, in Moravia. In the Thirty Years' War, his house at Fulneck was burnt down, and his library and MSS. were destroyed. Comenius fled to Bohemia, whence, in 1627, he was banished, and fled to Poland, where, in 1628, he began school-teaching at Lissa and wrote a great part of the *Didactica Magna*. In 1632 he was chosen Bishop of the Moravians. In 1641 he was called to England to meet Hartlib and Dury, and the three bound themselves as a triumvirate to carry forward educational reforms. The English Parliament were ready to invite Comenius to organize a college to carry out Lord Bacon's designs for the advancement of learning, but the great Civil War put an end to the idea. In 1642, Comenius was consulted as to educational organization in Sweden. In 1648 he became senior Bishop of the Moravian Church. In 1650 he took charge of the schools at Saros-Patak, in Hungary. In 1654 he returned to Lissa, but, owing to war, Comenius's second library and MSS. were burnt. In 1656 he fled to Amsterdam, where he was received by Laurence de Geer, the son of his old Swedish patron, Louis de Geer. He died at Amsterdam, 15th November, 1670. In *Unum Necessarium*, 1668, he described his life-task: "I thank God I have been all my life a man of aspirations. . . . One of my chief employments has been to deliver youth in the schools from the labyrinth in which they are entangled." F. W.

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COMMERCE, THE THEORY AND PRACTICE

OF.—As a separate subject of study the Theory and Practice of Commerce was only comparatively lately included in the curriculum of the commercial school, although it promises to become an essential subject in any complete commercial course. The term "commerce" may be regarded as embracing the study not only of the internal organization of different types of business undertakings, but also the relation of such undertakings to the outside world. It is used with both a wide and a narrow connotation. Its wider interpretation may be analyzed as shown on the opposite page.

It will be seen that the first group of subjects marked A deals with the Theory and Practice of Commerce regarded as a branch of the wider conception of the term commerce. This group may, for convenience of treatment, be sub-divided

Commerce in the Widest Sense.	A. Theory and Practice of Commerce.	I. General Theory of Commerce.	1. Elements of Commerce.
		II. Specialized Theory of Commerce.	2. Business Organization.
	B. Accounting.	III. Systematic treatment of Accountancy.	3. Methods of Payment.
			4. The Organization and Conduct of Trade.
		IV. Arithmetic as applied to Commercial Transactions.	5. Banking Organization.
			6. Commercial side of a Manufacturing Business.
	C. Auxiliary Subjects to Commerce.	V. Currency, Banking, Exchange and Credit.	7. Transport Organization.
			8. Special subjects— (a) Retail trade. (b) Co-operative, municipal and State enterprise. (c) Futures. (d) Import and Export Organization. (e) Corn trade. (f) Cotton trade. (g) Engineering trade.
		VI. Recent Industrial Developments.	9. Introduction to Double-Entry Book-keeping.
		VII Allied Subjects	10. Theory and Practice of Book-keeping.
			11. Special Classes of Accounts— (a) Manufacturing. (b) Banking. (c) Companies.
			12. The Reading and Criticism of Balance Sheets
			13. Costing and Statistical Book-keeping.
			14. Introduction to Commercial Arithmetic and Algebra.
			15. Calculation of Interest; Discounts and Accounts Current.
			16. Commercial Arithmetic, including the calculations in connection with Money and Bills.
			17. Mathematics and Insurance.
			18. The Practice of Banking.
			19. The Stock Exchange.
			20. The Theory and Practice of Bills of Exchange.
			21. International Banking.
			22. Banking in the Service of the Trades.
			23. Recent Developments and Tendencies in Banking Practice.
			24. The Financing of Trade and Manufactures.
			25. Special subjects taken from Manufactures, Trades, Transport and Insurance.
			26. Advertising.
			27. Colonial Questions.
			28. Art of Salesmanship.
			29. Commercial and Economic History.
			30. Commercial and Economic Geography.
			31. Commercial Law.
			32. Special subjects in Commercial Law.
			33. Insurance in General.
			34. Special Branches in Insurance.
			35. Physical and Chemical Technology.
			36. Commercial Journalism.

into at least eight separate topics, the first three of which deal with the broad outlines of the subject, while Nos. 4-8 (inclusive) are intended for more detailed consideration.

The syllabuses in the Theory and Practice of Commerce, as issued by the Royal Society of Arts and the Union of Lancashire and Cheshire Institutes, are based upon a general survey of the leading economic and legal principles that underlie modern commerce, and it is with this general interpretation of the subject that we shall now deal.

Commerce may be said to embrace all those activities which are engaged in the removal of the hindrances to exchange, and in thus facilitating the distribution of goods. In the transfer of commodities from the producer to the consumer there are encountered the threefold hindrances of "persons," "place" and "time."

The Teaching of Commerce.—The first step in the teaching of the elements of this subject is to indicate the place occupied by commerce in the economic structure, and its functions in the industrial world. This necessitates a proper understanding of the economic meaning of "production." Production may then be classified according to its nature into—

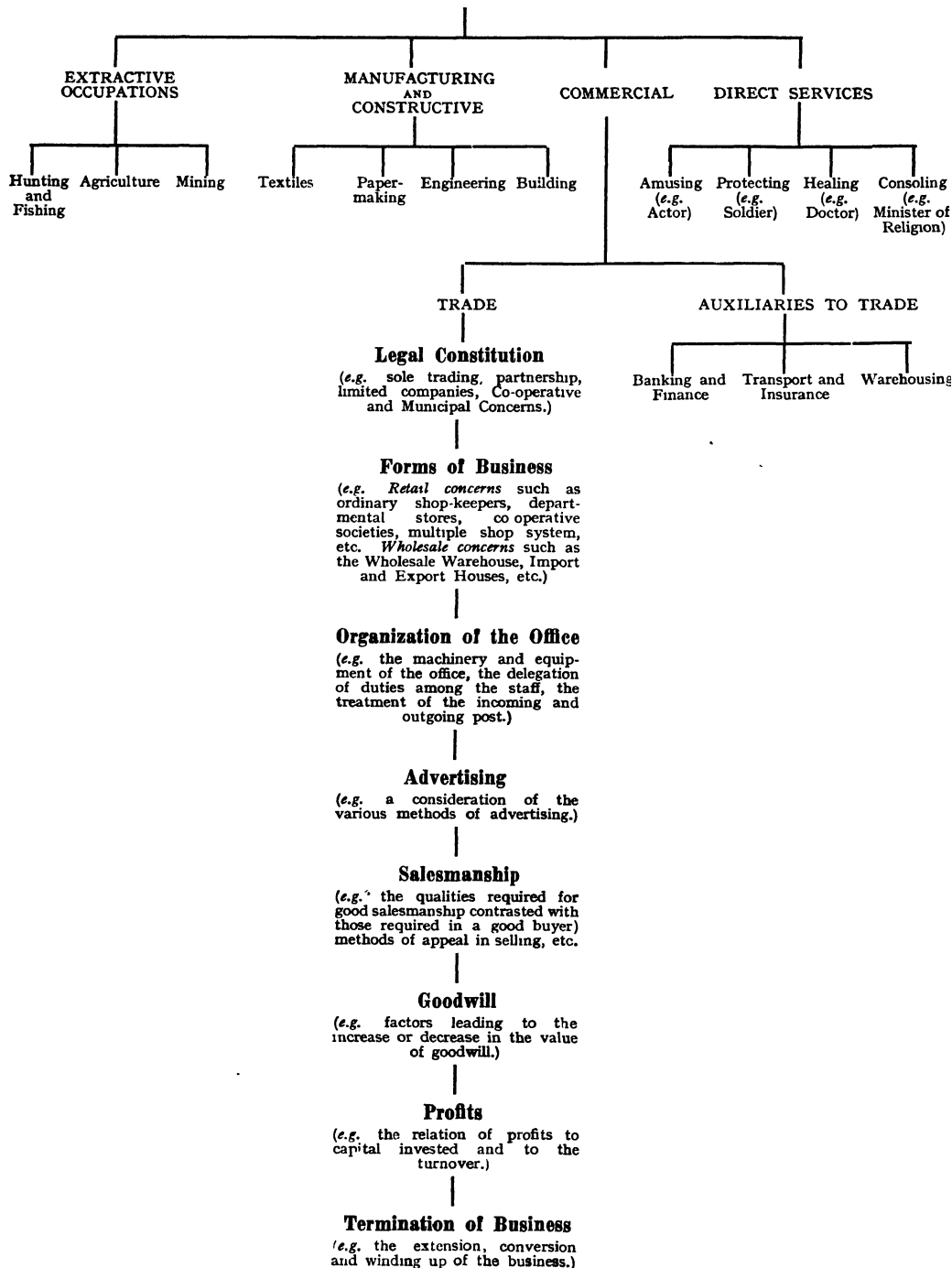
I. Extraction, *e.g.* hunting, agriculture, mining, etc.
II. Manufacture and Construction, *e.g.* engineering, weaving, building, etc.
III. Commerce.

IV. Direct Services, *e.g.* soldiering, teaching, etc.

The student should be given frequent practice in the classification of occupations under these various headings. The relation of commerce to other branches of industry being understood, the next step is to analyze commerce itself.

INDUSTRY

(i.e. All those activities engaged in the production of wealth)



The nucleus around which the entire commercial system has been developed is Trade, *i.e.* the buying and selling of commodities. Hence this forms a suitable starting point for an analysis of the scope of commerce.

Trade. This may be defined as the purchase and sale of goods with the definite object of re-selling them at a profit. Hence only those persons are regarded as actual traders or merchants whose occupation consists in buying goods with the object of selling them at a higher price without any apparent alteration of their form. The economic function of the trader should be clearly grasped.

It may be said to consist in rendering goods accessible to the consumers at the most convenient time and place, and in quantities desired by them. A careful examination will show that the trader is a useful and often indispensable member of the economic organism, for, by his activity, values are not only transferred but are also increased. Through the agency of trade, materials which formerly possessed little or no value are so transformed as to possess greater utility, and are distributed where they are more urgently needed and therefore command higher prices. Thus the trader collects goods from different parts of the earth, and so distributes them with regard to time and place that superfluity and want are minimized and a comparative steadiness of prices is achieved. The trader also seeks out the best sources of supply and the most favourable opportunities of sale; awakes dormant desires, and stimulates further needs; warehouses goods in time of over-production in order that future wants may be supplied, and finally regulates production in accordance with the fluctuations of demand and supply. The services of the trader are useful to producers as well as to consumers.

The trader is responsible to the producers for the sale of raw materials and manufactured goods. To them he renders services which they themselves do not care to undertake, partly in consequence of their inexperience and lack of specialized knowledge, and partly because they fail to control a sufficient amount of capital. Moreover it is impossible for the individual consumer to satisfy his varied needs so advantageously without the intervention of the trader.

Along with the many advantages of trade should be mentioned some of the disadvantages. In the first place the producer does not remain so closely in touch with the wishes and needs of the consumer, and is often too much at the mercy of the trader. Again, traders often charge unreasonably high prices for their goods. Both these factors are in operation, and trade is often carried on by large capitalistic combinations such as "rings," "trusts," etc., which enable the trader to utilize the state of the market to the disadvantage of both producers and consumers. It will, also, be found necessary to deal with these various forms of business undertakings, and to inquire into the reasons for their existence.

In dealing with the home trade it will probably be found advisable to trace out a series of imaginary transactions, such as would take place between the retailer and the wholesale warehouse. The same plan could also be adopted in dealing with the import and export trade. In this way the students could be led to familiarize themselves with the various credit documents used, and

naturally would also be introduced to the various kinds of intermediaries and their methods of dealing.

In addition to the study of the general organization of the home and foreign trade, consideration should be taken of markets, fairs and exchanges, docks, exhibitions, the consular service, and Chambers of Commerce.

Banking and Finance should receive a general treatment, beginning with the various methods by which a trader pays his accounts in the home trade, leading on to a description of the banking system, and its relation to the Stock Exchange and the foreign exchanges. At this stage it would also be convenient to deal with the various forms of speculative enterprise, the illustrations being drawn from the stock and produce exchanges.

Transport and Insurance. The function of this branch of commerce is to abolish the hindrance of "place," and so to produce an increased value of the goods. The alteration of the position of the goods thus enables the wants of the consumer to be satisfied. The various modes of transport should be contrasted and compared, and the method of determining the rates charged for freights should be thoroughly understood; since there are always risks of various kinds connected with the transport of goods, the necessity for insurance naturally arises. Marine Insurance should receive the most detailed treatment, whilst other relevant forms of insurance may be dealt with less exhaustively in-so-far as they have reference to the trader.

Warehousing should be dealt with separately since it is one of the trader's most important auxiliaries. For convenience it may be classified as (1) at the docks, and (2) wholesale. In the latter case, the question of organization arises. The art of buying and selling, the meaning and calculation of the turnover, the profits in relation to the turnover, and working expenses, should each be carefully considered. Thus the student should be brought to see clearly the close inter-relationship involved in modern commerce. The trader is dependent upon transport facilities for the carriage of his goods, and hence upon the increase of facilities by land and sea. He is dependent upon the banker for his capital and the financing of his operations; upon insurance to safeguard himself against future contingencies, and finally upon warehousing for the storage of his goods. Such a general sketch may be suitably concluded by an outline of the various trading activities undertaken by the State, and an examination of its attitude in relation to commerce.

J. STEPHENSON.

COMMERCIAL ARITHMETIC, THE TEACHING OF.—Arithmetic, in its modern aspects, is of two kinds: (1) pure or mathematical arithmetic, treating of abstract number, and including the principles of computation and the theory and laws of arithmetical operations, together with the comparison of magnitudes by means of ratio and other functional relations—which may be called arithmetical science; (2) applied arithmetic, dealing with the magnitudinal relations of concrete quantities of all sorts—which may be styled the art or practice of arithmetic. The requirements of everyday life include a continual comparison of values: one of the chief applications of arithmetic is, therefore, to money and its equivalents, a branch which is

usually named commercial, financial, or business arithmetic.

In early days arithmetic was taught with this one end in view; it was essentially a non-mathematical subject, and its teaching seldom lay in the hands of mathematical men. The writing-master was also the teacher of arithmetic; neatness, well-formed letters and figures, flourishes and ruler-work, were the touchstone of successful teaching. The rules were taught dogmatically; slavish imitations of worked examples and strict adherence to cast-iron methods led to long and cumbrous calculations, in which often tedious multiplications were performed only to be undone by division a few steps later; each application to a different phase of business life necessitated a new chapter, and these chapters were all kept in haughty isolation, being hardly on bowing terms with each other. "In one small arithmetic of less than 200 pages, there are Tare and Tret, Fellowship without Time, Fellowship with Time, Freehold and Lease, Chain Rule, Arbitration and Exchange, Alligation Medial, Alligation Alternate, Single Position, Double Position. Some of these have disappeared so completely that very few people have even so much as heard of them."

Modern school practice has made of the third "R" a valuable educational instrument. The early teaching of number is necessarily concrete, but the universal applicability of its principles comes to be gradually realized by the learner, and a sound philosophical treatment is then possible. Algebra and geometry are occasionally called in to shorten and clarify complicated pieces of reasoning. A boy or girl usually leaves school in possession of tolerable skill in handling number.

It is a question, however, how much time should be given at school to commercial arithmetic, which includes interest, discount, stocks and shares, foreign exchanges, etc. "The subject introduces no new mathematical principles, and it involves a large amount of technical detail connected with commerce and finance which is very difficult for boys at school who have no experience of the world of commerce, but which they can acquire easily later on. Moreover, the average mathematical teacher cannot be expected to be thoroughly familiar with modern developments of the detailed practice of large commercial houses, banks, the Stock Exchange, etc., so that his description of Commercial Arithmetic is apt to be antiquated and unreal."

It would appear, therefore, that the subject is best left to be treated in detail as a continuation subject. It should be associated with book-keeping and commercial practice; and the teacher is likely to be better equipped if he is a man of business experience. All academic excrescences should be ruthlessly pruned away—such as *true discount* and *recurring decimals*; the idea of the former should be suppressed in favour of *present value*; and for the latter, fractions and approximations substituted. Actuarial science is an outgrowth of algebra rather than of arithmetic, yet annuities and assurances cannot be omitted from a complete course of mercantile arithmetic.

A habit of thought to be cultivated is that of thinking in percentages: it provides a common ground for international business transactions, whereon one is independent of units. A good deal of attention should be given to computation and the discriminating use of short methods;

rough approximations should be insisted on in every problem where they can be usefully employed; logarithms must be used to lighten heavy calculations. Graphical work is useful as a means of both illustration and calculation. Many questions of interpolation are solved most easily by this method. A graph provides the simplest rough transformation from one set of units to another, and may be used advantageously in questions of foreign exchange. Statistics are conveniently dealt with graphically. "The complicated time-tables of some of the railway companies are worked on squared paper and allow the position of a train at any time to be seen at a glance."

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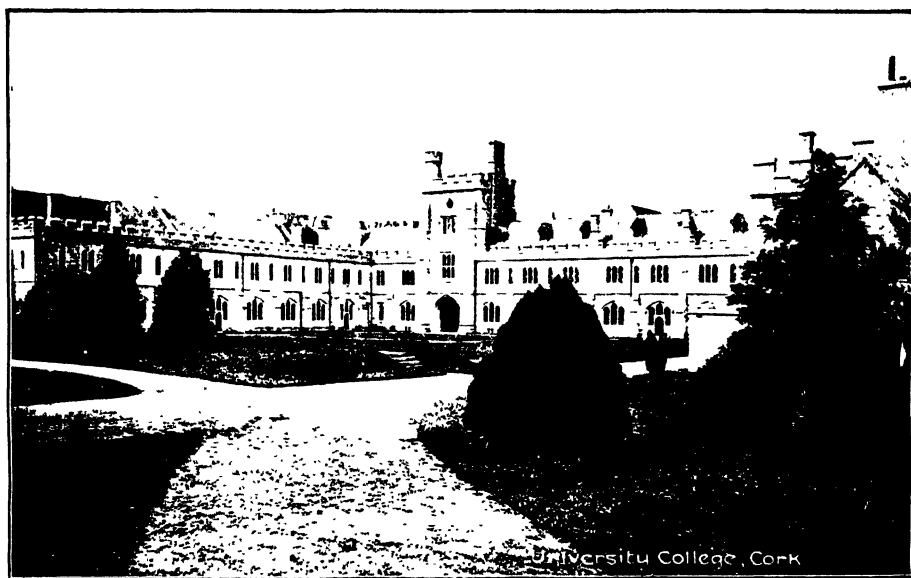
COMMERCIAL EDUCATION.—During the last generation, the educational point of view in England has shifted in a remarkable way. Formerly, all education, except primary, was directed towards the achievement of academic scholarship, and was entirely antagonistic to utilitarian interests. Though this condition, to a certain extent, still survives, on account of our traditions, yet the aim of education in England and abroad is not exactly what it was. Commercial education has come to take its place in our educational system, and is daily becoming more and more important. It is difficult to give a true definition of commercial education. In the early days of its appearance, it consisted of the study of Shorthand, Typewriting, Book-keeping, and similar subjects, taken up in a disconnected form in evening schools, the aim being to provide youths and girls with a means of acquiring knowledge which could be immediately applied in their daily lives. It was absolutely utilitarian in its aspect, and for this reason received but little encouragement. There is still the feeling, even amongst the initiated in the educational world, that commercial education consists of such instruction. This is not the sense, however, in which modern teachers regard it. Commercial education is merely a branch of education designed to make provision for a class of persons destined at a later age to enter into business life, not perhaps specially prepared for any particular position, but so equipped as to be able to adapt themselves to the requirements of commercial life generally. It should in the future be a highly developed educational force.

If the matter is looked upon in the true light, there is no doubt that pupils undergoing commercial training do not necessarily lose sight of the importance of culture and the humanities. The basis of commercial education is political economy, and the chief province of political economy is a study of business life. We must concede that in a community such as ours, business life is one of the most important factors. It is not generally recognized that commercial practice can be approached from a scientific point of view, and few persons are acquainted with the science of business. A change to another mode of thought is seen in the fact that university education is beginning to sweep into its embrace those persons who are seeking careers in commerce. The American universities have now highly developed faculties of economics and commerce closely allied to each other; and our own modern universities have training specialized to business needs, consisting



Clifton College, Bristol

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The Governing Body, Cork University College

Cork University College

of an extensive course of instruction designed as a preparation for aspirants to business honours.

In the Universities. A glance at the curriculum of the Faculty of Commerce in the Manchester University will illustrate what is being done. In this faculty, two degrees are awarded:—the degree of Bachelor of Commerce and that of Master of Commerce. All candidates for the degree of B.Com. are required—

(A) To have passed the Matriculation Examination of the Manchester University or the Final Examination for a degree in some other University of the United Kingdom;

(B) To have attended a course of study approved by the University, extending over at least three years; and

(C) To have passed an Examination in the following subjects: (1) Political Economy; (2) Geography; (3) Modern History; (4) a Modern Language; (5) the organization of Industry and Commerce; (6) Accounting; (7) Commercial Law; and (8) one or more of the following special subjects: (a) Certain subjects for the Final Examination for the degree of Bachelor of Science; or (b) two subjects chosen from a science of the Intermediate grade, a second modern language, a more advanced stage of the modern language already selected, Currency and Banking; or (c) in lieu of one subject under head (b), two of the following: Accountancy; Foreign Trade and Foreign Exchanges; Railway Economics and Transport; the Cotton Industry; Insurance; Public Finance; Statistics; a special subject in Law; International Law; a special period in Economic History; a special subject in Geography; Political Science; Law and Custom of the English Constitution; a second special period in Economic History; and a special subject in Economic History.

The Commerce Degrees of the Manchester and Birmingham Universities have been in existence some considerable time. Great progress has not, however, been made so far as the number of those taking advantage of the facilities offered is concerned.

London Degree in Commerce. The London University has made provision for a Science Degree in Economics, but, until quite recently, no steps have been taken to institute a purely commercial degree.

A combination of university and business interests, however, has recently been built up, and a course of study arranged for the Degree of Bachelor of Commerce in the London University. Candidates for the degree of Bachelor of Commerce are required to have passed the Matriculation Examination, and to pass two subsequent examinations—the intermediate and final. The requirement of the Matriculation Examination will limit the degree to young students passing from the secondary schools, and may possibly debar older men who are unwilling to take the Matriculation Examination at a stage when they have obtained a practical knowledge of business affairs. The desirability of instituting a matriculation test of a different nature for older students is a matter worthy the attention of business men and University Authorities, if the present new degree is to prove an incentive to higher educational training amongst adults.

The following are the details of the scheme in broad outline—

The Intermediate Examination is divided into

two parts, which may be taken on the same or different occasions, as follows—

Part I. Economics, Geography and one language.

Part II. Banking, Currency, Trade and Finance, and Accounting or History, and an optional subject, namely, one of the following—

A second approved modern foreign language; Chemistry; Physics; Geology; Botany; Pure Mathematics; Applied Mathematics; History—(a) History of Industry and Commerce; (b) World History, with special reference to the nineteenth century; English; Commercial Art or Art as applied to an Approved Manufacture.

The Final Examination is divided into two parts, of which the compulsory subjects form Part I, and the optional subjects form Part II. A candidate may take Part I and Part II on the same occasion; or he may take Part I on one occasion and Part II on another occasion.

The compulsory subjects are—

1. *Banking and Finance Group.* (Recommended for candidates for banking, finance, etc.)

2. *Trade A Group.* (Recommended for candidates for Colonial and general trade, and in certain cases for distributing trades.)

3. *Trade B Group.* (Recommended for those engaged in the trade of a definite area (e.g. Brazil, India, China, Russia, Scandinavia.)

4. *Industry Group.* (Recommended for candidates in engineering and metal trades, distributing trades (in certain instances), and generally for those engaged in works and factory management.)

5. *General Transport Group.* (Recommended for candidates desiring a wide knowledge of transport and its bearings.)

6. *Shipping Group.* (Recommended for candidates for the shipping trade.)

7. *Inland Transport Group.* (Recommended for railway candidates.)

8. *Public Utilities Group.* (Recommended for candidates in such undertakings as gas, electricity and hydraulic power, water supply and irrigation.)

9. *Commercial Art Group.* (Recommended for certain classes of candidates in the distributing and other trades.)

A Master's degree will be instituted to follow upon the Bachelor's degree; but before the Bachelor is allowed to proceed to the Mastership he will be required to have had a suitable practical commercial experience extending over a period of not less than two years after having taken the B.Com. degree.

Of course, if we are to consider commercial education merely from the side of the University, we are starting at the wrong end, unless we at once concede that commercial education is purely a matter of specialization, and that no attempt should be made to provide instruction in business facts to pupils under University age. We are just beginning to realize that it is time to cast aside the idea that office work must be learned in an office and banking behind the counter of a bank. This will not be fully accomplished until we have definitely decided that we are not entitled to call detached commercial studies "education."

Scope of Commercial Education. Something more is required than the studying of commercial subjects if we are really to educate for commercial life. Half the trouble that a young man in business experiences is due to the fact that he finds a great change on entering a commercial house. A boy going into business should have some elementary notion of the development of industry and commerce,

of demand and supply, and the geographical conditions which determine the production of foods and clothing; he should know the principal markets for these, how the commodities come from the market to the wholesale house, from the wholesale house to the retail house, and how they are distributed to the populace at large; how we pay for them; and the principles underlying credit, banking and exchanges. He should know something of the laws of demand and supply, and the facts that go to determine the worth of a man's labour. All this is commercial education, called by some "Economics." A smattering of book-keeping, a little shorthand, a knowledge of the mechanism of the typewriter and the appropriate finger to use when striking a particular key, is not the end of commercial education. It is exceedingly useful that such practical matters should form part of a commercial syllabus; but any person who has been educated under a *régime* where real commercial education is understood will enter his business life possessed, in addition, of a thorough knowledge of fundamental business principles in their widest sense.

The changes in the attitude of educationists towards commercial education are plainly indicated in the evolution of one subject in the commercial syllabus. Formerly known as "Business Methods" or "Business Routine," it has gradually changed its form and passed under various titles, such as "Office Work and Practice," "Business Training," and, more recently, "Commercial Practice" and "The Theory and Practice of Commerce." As originally taught, this subject consisted of commercial correspondence, the writing of a set form of business letter in very stilted English, and the learning by heart of matter which could easily be referred to in the Postal Guide. It has, however, by a natural sequence of events, become a subject including all the principles underlying the production and distribution of commodities at home and abroad. A higher grade of the subject is generally known as "The Organization of Industry and Commerce," which is Applied Economics. There are still people who do not think that business facts can be approached from a scientific standpoint; but most of the social sciences can be taught in an elementary way, and upon such teaching may be based the practical work of the student's after life. Though an advanced study is not possible at school, yet what is touched upon and enjoyed there is, in after-life, by no means useless.

Evening Schools and Commercial Education. The growth of commercial education in England has been closely allied with the growth of evening schools. Commencing with voluntary enterprise, it may be roughly said that the mechanics' institutions were the forerunners of our evening school work, although they were avowedly technical in their principles. The old School Boards took up the matter of commercial education in the evening, and their work was continued by the Education Committees founded under the Education Act of 1902; but it is only within recent years that any steps have been taken to introduce commercial work into day schools. For some considerable time no provision was made for schools having a commercial bias; but the present seems to be a time of revolution, and, side by side with the trade schools which are springing up in industrial centres, we find commercial schools, conducted either by the local authority or, more commonly, by private enterprise. A disadvantage of the evening commercial

school has been that an interval has been allowed to elapse before students passing from the day school have taken advantage of the evening classes. This disadvantage is eliminated by the erection of day commercial schools. Commercial work may be carried on in day schools of the ordinary secondary type having a commercial bias, or in schools entirely devoted to the commercial aspect of education. Elementary schools should be closely co-ordinated with the work of such secondary schools. No specialization should be allowed in the early stages, but in the final years as much specialization should be allowed as would properly co-ordinate the school work with actual business life. Above all, it would be necessary to see that the proper kind of teacher was appointed. In the past, the work of evening commercial schools has been carried on by business men who have not shown themselves entirely able to cope with this most difficult branch of our educational system. The gap which often occurs between the elementary school and the continuation school has frequently to be bridged over by men who are practical business men, having little or no knowledge of teaching, except such as is inborn in them or learned in the office or counting-house. The knowledge of human character gathered by contact with other men has been of advantage to them, but it has not altogether made up for the lack of teaching experience. The most desirable qualifications for teachers of commercial subjects are similar to the qualifications desirable in any teacher. They are a practical knowledge of the subject taught, coupled with a knowledge of teaching methods. For the work of teaching in commercial schools, other things being equal, a preference must be given to the practical man of affairs; but, unless other things are equal, it is better to employ thoroughly trained and competent teachers even though less technically expert. In a secondary school having a commercial bias or entirely devoted to commercial subjects, the English subjects would not differ greatly from those taught in any other secondary school. Literature must not be neglected, as there is no wide or startling difference between commercial and literary English. The difference chiefly lies in subject-matter and style, simplicity and clearness being as desirable in a letter as in any other English exercise. A good knowledge of literary English and a study of our best writers cannot fail to have a good effect in assisting to produce the standard of education required in a youth who in future is to be engaged in a business house. Languages, mathematics, citizenship, economics (including economic history and geography) would also find their places; whilst book-keeping, shorthand, and the theory and practice of commerce would not be neglected. It has been said that our system of education makes too many under-clerks, but a sound commercial education would remedy this evil instead of exaggerating it, as we should thereby produce more individuals capable of qualifying for positions much higher in business life.

R. W. H.

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COMMERCIAL EDUCATION, MUNICIPALITIES AND.—(See MUNICIPALITIES AND COMMERCIAL EDUCATION.)

COMMERCIAL GEOGRAPHY.—(See GEOGRAPHY, THE TEACHING OF COMMERCIAL.)

COMMERCIAL INSTITUTES.—(See CONTINUATION SCHOOLS, EVENING.)

COMMERCIAL SCHOOL, TEACHER IN A.—(See TECHNICAL COLLEGE OR SCHOOL, TEACHER IN A.)

COMMISSIONS, EDUCATIONAL.—(See BRYCE COMMISSION, THE; CROSS COMMISSION, THE; EDUCATIONAL SETTLEMENT COMMITTEE, THE; etc.)

COMMON ENTRANCE EXAMINATION TO THE PUBLIC SCHOOLS.—(See PREPARATORY SCHOOLS.)

COMMON LAW AND EDUCATION.—The study of the growth of the English common law is one of the most important branches of legal learning. It touches every aspect of national life, and is of peculiar interest in the region of education, where the canon law, the municipal law, and customary law meet.

The Right to Learn. From Saxon days the local English canon law made it the duty of every parish priest to provide a free school, and the relationship of the priest and the people was such that a moral duty was in effect imposed upon parents to send their children to the parish school. But customary law, in the vast majority of manors, placed an extraordinary limitation on this duty. The children of the serfs or unfree parents were only allowed to attend school on the payment of a fine to the lord of the manor. Instances of such customs may be found in the Manor Rolls of Burcester (Oxford), Clymeslond (Cornwall), Wenslow (Bucks), Bernehorne (Sussex), Hoton (Essex), and Lymnesfeld (Surrey). The object of those customs was to prevent boys obtaining the knowledge that would enable them to become priests and therefore free. The custom was universal in Wales. It was consistent with the common law, which provided (*Articles of Clarendon*, XVI, 1164) that "the sons of tenants in villanage, ought not to be ordained without consent of the lord on whose lands they were born." Thus the canon law and the customary law were directly opposed: the Church standing for freedom, the baronage for serfdom. In 1391 the House of Commons, in an effort to prevent the final failure (through the Black Death and other economic causes) of unfree labour, petitioned the Crown to forbid unfree children to attend school "pur eux avancer par clergie." King Richard II at once refused the petition, and in 1406 Parliament finally laid down as the common law the right of all persons to have education. The statute runs as follows "Every man or woman of what state or condition that he be, shall be free to send their son or daughter to take learning at any school that pleaseth them within the realm." It was a great victory for people and Church alike. The right to education finally had been secured. For more than 600 years the English people have had perfect freedom to "take learning at any school that pleaseth them."

The Right to Teach. The next step was the freedom to teach. In this struggle, the Church of Rome was opposed to the people. The Church stood for

an exclusive system of licensed teachers. From the earliest Norman times, education had been highly organized by the Church in definitive administrative areas governed by the bishop or by the heads of great monastic or secular houses. The bishop or abbot was the *magister scholarum*, and entirely controlled the teaching in the school by only permitting schools to be held by teachers who were duly licensed. It was in theory an excellent principle, and long outlasted the days of the Roman control. It was used by Queen Elizabeth as an effective instrument for securing a high standard of faith and learning.

Lollards and Education. But the system was resented by the English people, who, in the fifteenth century, as a result of the Wiclif movement, were looking for freedom in religion. The Lollards played a great part in keeping education alive in the dark century before the Reformation, both in the schools and in the universities. Unlicensed or adulterine schools multiplied. Such schools existed long before the Lollard movement, and gave great trouble to the bishops and the religious houses; but, after the Lollard movement began to take national dimensions in the teeth of stern legislation, the question of free schools became an acute one. On this question the courts of justice, as representing the principles of the common law, deliberately sided with the people against the Established Church as the Church had sided with the people earlier against the Baronage. The question of the freedom to teach came definitely before the courts in the *Gloucester Grammar School case*, decided in the year 1410, and fully reported in the *Year Book* [11 Henry IV] (Case 21, page 47). In this case, the masters of the grammar school brought an action of trespass against the master of a private school who was offering education at a cheaper rate than that provided by the school that was controlled by the Prior of Lanthony, near Gloucester. He claimed an exclusive right to appoint teachers. The court dismissed the action, and Mr. Justice Hill laid down the principle of the common law when he said: "There is a fundamental failure in the case to maintain action, inasmuch as the plaintiffs have no estate, but merely an uncertain ministry like any other person who, being as well qualified as the plaintiffs are, comes to teach youth. It is a virtuous and charitable thing to do, helpful to the people, for which he cannot be punished by our law." In this case it was settled that any one, duly qualified in the matter of learning, is entitled to teach. Thus before the Reformation the common law had laid down that the rights to learn and to teach are inherent rights of the English people. It is true that the Elizabethan bishops endeavoured once again to cut down this right and to limit teaching to persons who carried the episcopal license; that this claim was renewed under Charles II and James II. But the claims had no sanction at common law, and were deliberately swept aside by the law courts in a series of seventeenth and eighteenth century cases.

The Legal Duty to Provide Education. The next step was to impose a legal duty on parents to teach, or secure teaching for their children. As late as 1796 it was held by Lord Kenyon in the case of *Hodges v. Hodges* (*Peake's Reports*, Vol. II, p. 79) that there was no duty at common law laid upon a parent to educate his child. The judge said that "a father was bound by every social tie to give his children an education suitable to their rank, but it was a duty of imperfect obligation, and could

not be enforced in a court of law." It was long before this "duty of imperfect obligation" became a legal duty. By Section 74 of the Education Act, 1870, school boards were empowered to make by-laws requiring parents to send children between the ages of 5 and 13 years to school, but it was not until 1876 that the universal legal duty of the parents at common law was finally declared. The fourth section of the Elementary Education Act, 1876, declares it to be the duty of the parent of every child to cause such child to receive efficient elementary instruction in reading, writing, and arithmetic. Subsequent legislation of 1902 and 1918 has extended this duty, and to-day legislation imposes upon the parent, the employer, and the child a duty to secure for the child some form of education up to the age of 18 years, and imposes upon the State the duty of making ample provision for the physical and intellectual welfare of every child. This is the natural evolution of the common law of education. J. E. G. DE M.

COMMON SENSE PHILOSOPHY.—This philosophy had its origin in a controversy arising from Hume's *Treatise on Human Nature* (1739). Thomas Reid was so revolted by the conclusions drawn by Hume from the idealism of Berkeley, that he was led to find a new basis for the common notions as to a material world. Roused to metaphysical research, he became the chief of a school whose aim was to deliver philosophy from scepticism by relying unconditionally on principles of intuitive origin. Opponents argued that memory is unreliable, and that he was appealing to the unreasoned verdict of ordinary consciousness. Reason for this attack can be found in certain passages of Reid himself, and still more in the harangues of lesser men, such as Beattie and Oswald, who joined in the outcry against Hume. Reid's answer to Hume, *An Enquiry into the Human Mind on the Principles of Common Sense* (1764) gave rise to the somewhat misleading name of Reid and his followers. They are also known as the Scottish School of Philosophy. The fact that Hume is not included shows that the name is not merely a mark of nationality, but expresses a definite tendency in philosophy. The most eminent successors of Reid were Sir W. Hamilton, Dugald Stewart, and McCosh.

The weakness of Scottish philosophy has lain in its tendency to treat the rational elements as single intuitions, and the frequent allusion to the testimony of consciousness often proves unconvincing. This philosophy has given rise to a vast amount of psychological observation. It had a wide influence not only in Scotland and America, but also in France, through Cousin and his spiritualistic followers. (See also REID, THOMAS.)

COMMONPLACE BOOK.—A form of note-book kept by students in the Middle Ages, in which was recorded information on various subjects which might be useful for future reference. The great teachers of the time recommended their use, and gave instructions as to what should be recorded in them. Many such books were used to contain notes of the important parts of lectures. Sheridan speaks of "Your commonplace book—where stray jokes and plumed witticisms are kept with as much method as the ledger of the lost and stolen office." Felton uses the word "commonplace" as a verb—"collecting and commonplacing an universal history."

COMMUNITY, EDUCATION IN RELATION TO THE GENERAL WILL OF THE.—The conception of a general will in education can only be regarded as a regulative ideal, the realization of which has not yet been attained by any nation. The nearest approach recorded in history to the expression of a people's character in the training of its citizens as a whole would appear to be the education of the Spartan youth. This would hardly, however, satisfy Rousseau's doctrine in *Le Contrat social* (see ROUSSEAU), which seems to require the direct translation into the regulations, and ordered form of the people's life, of the will of the existing body of citizens at any time. It implies, in fact, a progressive community carrying out the will of the present irrespective of tradition. In education pre-eminently, the conservative and liberal forces of national life ought to work in harmonious co-operation. The system should be such as to maintain the national character. It should also be, in a supreme sense, the vehicle of freedom, or the general will realized in forms which further the complete development of all future citizens to their own highest level, and so facilitate the progress of the national spirit. But this postulates an elasticity of system almost unattainable in education, the paradox of which is that, although it is one of the chief of the spiritual activities of the State, it tends irresistibly to form a structure unresponsive of the new ideas accompanying the essential and normal development of national life. At times of crisis, on the other hand, education may become a highly sensitive element in the constitutional fabric, liable to be affected both by the waves of popular passion and by the doctrines of enthusiasts who see in it "the fortress of the State," or politicians who recognize it as a powerful instrument in the formation of opinions and desires. The controversies which arise at such moments show a confusion over issues, a blindness to the function of education in the preservation of the values of history, which could not be if it were the constant expression of the national will. A subordinate question, such as the use of education for the furtherance of industrial prosperity, tends to usurp the whole field.

If we are to find a way of interpreting the development of education in modern times as in any degree showing the relation of direct reaction to the central growth of national character and aims, it must be through conceiving the leading educational reformers as themselves representing the national will most truly, whilst it is still not fully realized by the majority. Only in this light could it be said, for instance, that either "compulsory" education, or "free" education, was the *fiat* of the general will at the moment when the idea of the reformers was taken over by a political party.

As an example at the present day of an effort towards the realization of the people's will in education in one direction, might be cited the movement of the Workers' Educational Association (*q.v.*). It should be noted that history seems to show that in the hands of a Government which does not represent the popular will in a democratic sense, education may be used as an engine for restraining the growth of a free general will through the imposing and fostering of a certain set of ideas, to the exclusion of others. H. D. O.

COMPARATIVE PSYCHOLOGY.—(See ANIMAL PSYCHOLOGY.)

COMPARATIVE TREATMENT OF LITERATURE, THE.—(See LITERATURE, THE COMPARATIVE TREATMENT OF.)

COMPARISON.—(See FIVE FORMAL LESSON-STEPS, THE.)

COMPLICATION.—(See ASSOCIATION, PSYCHOLOGY OF.)

COMPOSITION, ORAL.—The practice of oral composition, long popular in American schools, has only recently become common in ours. Yet its utility is obvious. It not only prepares the way for written composition, inducing facility and finish in that art, but it also improves style in ordinary speech. It is true that everyday conversation would lose much of its ease and charm if a deliberate attempt to attain a perfect form of expression were made before every utterance; the practice of oral composition, however, leads to an unconscious effort for perfection, which need not in the least interfere with spontaneity or grace. The habit of quickly summoning the appropriate word to one's lips, formed by continual practice in school, obviates the necessity of using slang; and the pupil who has been well drilled in oral composition will be reluctant to leave his meaning ambiguous or uncertain. Oral composition must not, however, be regarded as a substitute for the written exercise; and in school it is chiefly useful in the lower forms before pupils have acquired much facility with the pen. It may, indeed, be begun before the child can either read or write.

Methods Useful with Junior Scholars. The ordinary and obvious method is to read or tell a story to the class and require the pupils to reproduce it by word of mouth, each of them contributing a certain portion. At first, it will be found that many pupils are very self-conscious: as soon as they stand up to speak before their fellows, they are hopelessly tongue-tied; or, if they are very young, it may be found that they cannot construct many complete sentences without great difficulty. It is, therefore, necessary to encourage a child to speak, to help him out by supplying the word for which he is seeking, and to avoid much correction of vocabulary or form. Once self-confidence is attained, corrections may be made more freely; but it is plainly somewhat paralysing to an eager child to be pulled up in the middle of his speech because he has committed some verbal solecism. Faults such as dropping the aspirate, or a "Cockney" accent, should not be corrected at all in this lesson. The proper time for speech drill is before or after the language or literature lesson; and pupils who are thus perpetually drilled will soon cease to commit these errors—at any rate, in the school.

Methods Suitable for Senior Scholars. When pupils are old enough to consult books for themselves, many interesting exercises may be devised. Thus, each member of a form may choose and prepare a story and relate it at the next lesson. Apart from errors of accident or syntax, there will generally be much to criticize in the form of the story. Some will tell a tale quite baldly, reproducing the facts without the slightest attempt at colour or arrangement of matter; others will elaborate minor details so much as to reduce the main theme to insignificance; or spend so much time on the opening that the conclusion, to which all the other parts should be subservient, is weak and hurried. All these faults may be more effectively

dealt with in oral than in written composition, because the other pupils forming the audience will realize by their individual impressions the truth of the teacher's strictures. They may, indeed, be encouraged to contribute their own criticisms, and so arrive for themselves at the principles.

Many subjects besides the story may be chosen for oral composition. With young children, indeed, every lesson should be a language lesson, in so far as they are required to formulate their own observations and discoveries, but it is not possible in lessons of which the primary object is the attainment of knowledge to spend much time on insisting on the absolutely correct use of language. But, even admitting this, it is to be regretted that many teachers miss the opportunities presented by the geography, history, and Nature lesson to train their pupils in correct expression.

It is true that, with older pupils, many teachers have adopted the plan (borrowed from America) of "topics." Certain topics connected with the subject studied—let us say, history—are assigned to different pupils who, at the next lesson, are required to discourse to the rest of the class on the subject set. The present writer has recently heard, in a school that had adopted this plan, excellent dissertations on the career of Sir Thomas Wyatt and the settlement of the American loyalists in Canada. An expansion of this idea, to be carried out in the composition lesson proper, is to require pupils to prepare set lectures on some particular theme, which they must deliver without any further aid than a few notes. This method is particularly to be recommended for pupils old enough to have formed some personal bias to particular subjects. A boy who is especially interested in geography, for instance, will be delighted to have the opportunity of enlightening the rest of the class on some topic more familiar to him than to them, and it is possible even for a dull pupil to acquire the necessary information from books. Here, again, criticisms may be invited, or questions may be asked, which will show the lecturer where, either from confused thinking, or failure to express himself clearly, he has not succeeded in conveying his meaning to his fellows. Such practical illustrations of the consequences of slovenly speech help to impress on the novice the importance of absolute correctness.

Another form of oral composition, which has the advantage of enlisting the activity of all the members of a class simultaneously, is the debate. In this case, two pupils (or four, if seconders are thought advisable) are required to prepare speeches presenting opposite opinions on the same subject, and the rest are expected to contribute something, even if it is only a sentence, to the discussion. In the warmth of the debate, even shy children forget their self-consciousness and become eager to contribute their opinions and, once their lips are unlocked, they rapidly gain confidence. Against this method it may, however, be urged that the excitement of a debate affords little opportunity to the teacher for formal corrections, because any interruptions of this kind are open to the fatal objection of making the discussion drag. The debate, therefore, should be of comparatively rare occurrence, and should be regarded by the pupils as a special treat.

C. L. T.

COMPOSITION.—(See ENGLISH COMPOSITION, THE TEACHING OF.)

COMPULSION AND FREEDOM IN SCHOOLS.—(See AUTHORITY AND OBEDIENCE.)

COMTE, AUGUSTE.—(See POSITIVISM.)

CONCENTRATION.—This article supplements the one entitled **CORRELATION**, for concentration, in the pedagogical sense, is an attempt to "correlate" in a peculiarly drastic manner. There is, however, a psychological sense of the word to which reference must first be made. When memory doctors and mental trainers offer to strengthen a client's "concentration," they are referring to a so-called faculty by which the mind, instead of dissipating its energies among a multitude of ideas, keeps energetic hold of a few. "Concentration of mind" here means much the same as "attention" of the volitional or strenuous kind. The reader is reminded that there is another kind of attention: the non-volitional or spontaneous kind; and that the relative merits of the two, and of the varieties of "interest" that accompany them, are matters of controversy. "Concentration" has, however, a pedagogical meaning slightly different from the above. It may stand for an attempt to correlate school subjects around a few leading facts or skills; it may, in short, be a device of the curriculum-maker. The notion is that, if the multitudinous ideas in the scholar's mind can be knotted together at certain points, the unity and efficiency of the mind will be secured. As with other human affairs, the practical need underlying this proposal is the main thing; the carrying out of the proposal and the psychology employed to justify it are open to considerable criticism. One interesting and early attempt to "concentrate" the curriculum was by employing Fénelon's *Life of Telemachus* as the peg on which to hang the various school subjects. Some of the post-Herbertians, notably Ziller (see **CULTURE STAGES**), employed the story of Robinson Crusoe as the centre for one year's work, this story being chosen because of its symbolic character as representing the early struggles of man to overcome Nature. The story of Hiawatha has been found to possess possibilities of the same kind. Such experiments are valid within limits; but, unless carried through with much common-sense, easily degenerate into pedantry. Still, to discover the fifty, one hundred, or five hundred most essential processes or facts of life, and to concentrate the curriculum around them, would be a task well worth attempting.

F. H. H.

CONCENTRIC METHOD.—This is a method, adapted to the teaching of certain subjects (such as geography, history, and science), in which the same course of study is taken in the various classes or forms of a school; but at each successive stage the circle of information widens. In history, for example, a brief outline of English history, perhaps only in story-form, is given to the lowest class. As the children proceed to a higher class, they again take an outline of English history, in which the information is fuller and of a more advanced nature. Thus, in their progress through the school, all children will learn the history of England in full, and there is no risk of their omitting any important period. This method is opposed to that of dividing the information into sections, one of which is taught in each class. The latter method requires every child to pass through the full stage in each class, otherwise some portion of the subject will be entirely omitted from the child's instruction.

CONCEPT, PSYCHOLOGY OF THE.—A concept is a general idea of a class of objects built up from a series of percepts of its individual members. The logical or perfect concept is the definition of the class characters, and comprises all the attributes essential to any individual class member. The psychological concept is the universal idea of a class existing in the mind of an individual, and approaches the logical concept as the knowledge of the class attributes increases. Thus the psychological concept "dog" of the dog-breeder approximates far more closely to the scientific description of the species than that of the individual who merely likes and keeps a dog.

The process of conception involves comparison, abstraction, judgment, and the synthesis of the universal from the particular. The formation of a new concept is well illustrated by the following: A child of three accustomed to a white, short-haired dog and a black, long-haired cat, was confronted with a small dog with long white hair. After some thought, she exclaimed: "A pussy bow-wow!" Here clearly the failure to place the new presentation under the concepts "cat" or "dog" existing in the child's mind resulted in the attempted formation of a new concept by comparison and abstraction.

M. J. R.

CONCEPTUALISM.—This is a philosophical theory which is a modification of Nominalism (*q.v.*). It is opposed to Realism in its solution of the problem of classification or "universals." At first, in the late Middle Ages, conceptualists urged that "things" or individuals are not to be supposed to be less real or of subordinate importance as compared with classes of things (man, white, etc.). For Realists seemed to make reality the class or universal, and to require a "principle" (*principium individuationis*) for making individuals out of the class. Conceptualists maintained, in opposition, that universals exist *in mente*; by which they meant in some other way than that in which things or individuals exist. But by their argument they seem to have been led to doubt the objective reality of universals. The later stages of Conceptualism may be connected with the work of Berkeley and Hume (*qq.v.*). Since their time many have supposed that the classification of things is "the work of the mind"; by which they appear to mean that, if it were not for the perceiving mind, things or individuals would not be like one another. There would then be no objective universal, or no reason other than the structure of the mind why science should deal with general statements. The popular form of philosophy is still affected by Conceptualism, since it is usually believed to be philosophical truth that, although "things" are not altered by being known, nevertheless the likeness between things cannot be as real as the things. Conceptualism has been useful in turning attention to individual objects of perception, and thus in assisting physical science: it has also led to the discussion of the structure and activities of the mind. It was a legitimate revolt against the earlier and cruder forms of Realism. But it is difficult to regard it now as a legitimate philosophical theory, since the distinction it makes between objects of cognition (some being real and some "the work of the mind") is incorrect and the terms are misleading.

C. D. B.

CONCEPTUALISTS, THE.—(See **ENLIGHTENMENT, THE.**)

CONCERTS AND ENTERTAINMENTS, SCHOOL.

—Schools undertake entertainments from a variety of reasons, but usually the chief object is to provide funds for school activities or charitable purposes. The preparation entails much extra effort on the part of staff and children, but there should be ample repayment in educational results alone; and, if the entertainment is carried through successfully, the reputation of the school is much enhanced.

If a school has many activities, it may have little time to spare for a concert; in which case "much money, little work" might be the object. On the other hand, a school might wish to make its concert the one important event of the year, and then there would be an ambitious programme, with costumes, and an orchestra, and a hired hall with a stage.

The size and nature of the platform or stage will settle the nature of the programme. If the school hall is used, it will probably be a small one, and will not allow of the use of large shows or displays of physical exercises. The organizer must adapt the concert to the stage.

A Conversazione and Open-air Concert. Probably the most profitable form of school entertainment is the school conversazione, with an *al fresco* concert: every child can be employed, and this secures a large audience. Each class should have an exhibition of its own work: there may be a flower show, exhibitions of stamps and models, and natural history collections, with prizes for the best exhibits. A lantern show is an attraction, especially if slides of school activities are available; and a concert should be held in the playground. If the weather is bad, a modified concert can be given in two "houses" in the hall.

Only a small charge need be made: a large audience will be attracted, and "room" can be found for all. An *al fresco* concert is best given in a square marked off with school desks, with the audience sitting and standing around it. Much of the school work can be used: drill, dances, action songs, massed singing, violin band. Vocal solos and recitations are better omitted, as they will hardly be heard.

Indoor Concerts and Miscellaneous Entertainments. The ordinary class-work in singing, physical exercises, and recitation can also, with a little trouble, be arranged to form a capital indoor concert, especially if plans are laid at the beginning of term. It should be remembered that the simple action song of the child of 7 attracts and pleases a parent quite as much as the polished Shakespearean recitation by the boy of 14. Parents come to see their children acquit themselves well rather than to get a good concert.

A more advanced programme would arrange for the various classes to prepare "items" which will combine into a harmonious whole. Thus, for a patriotic concert, one class could offer Old English games, songs, and dances, with simple costumes made at home or in the needlework lesson. Other classes would take Scotch, Welsh, Irish, Indian, or Colonial "items," all combining to form a grand Empire tableau at the end.

The operetta was very popular with schools some years ago, and will no doubt come into its own again as its educative value is appreciated. The miscellaneous concert hardly gives the children a taste for grand opera or good plays. The "Cantata" requires the selection of a "cast" and the working of the piece as a whole and not in sections. It should be costumed and staged. A good school with a staff

prepared to devote hours of time out of school will delight in it, and give perhaps half-a-dozen performances, clearing a considerable profit.

NOTES. 1. Generally speaking, it is best only to use children in a school concert. Outside "stars" want humouring and perhaps "expenses." They are out of place, for parents wish to see and hear only their own clever children.

2. Full use should be made of the school violin band, which may be strengthened with other instruments.

3. Always have understudies for all principal characters.

4. Never sell more tickets than the room will hold. If you do, it will be remembered against the school next time.

G. G. L.

CONDORCET, JEAN, MARQUIS DE.—A famous French mathematician and philosopher; secretary of the Academy of Sciences, and member of the French Academy. He was born in 1743; educated in the Jesuit College at Reims; and at an early age gained fame by his application of analytical methods to mathematical studies. At the age of twenty-two, he published an essay on the integral calculus, which d'Alembert declared to be of great merit and deserving of the encouragement of the Academy. The calculus of probabilities, discovered by Pascal and Fermat, owed much to Condorcet, whose efforts in developing its theory led to the abolition of lotteries and many games of chance. Condorcet was admitted to the Academy in 1769, and his previous successes and popularity led him to enter into economical and social discussions; and thenceforth he took a prominent place in religious and philosophical controversies, associating himself with Voltaire, d'Alembert, and other great leaders of French thought. He, however, still continued his scientific work until the suppression of the academies in 1793. His first religious work was *Lettres d'un théologien* (1774), in which he propounded the theory that evil springs less from the nature of man than from bad laws and bad institutions. During the Revolutionary struggles, Condorcet took no decided part; but, as a noble, was proscribed by the Convention. For a time he was able to escape death by hiding away, and in a garret wrote an unfinished work—*Essay on the Progress of the Human Mind*—in which he displayed the impassibility of a stoic spirit, and which contained no complaint on the misfortunes of himself or his family. He was arrested, but took poison to avoid public execution (1794). (See also FRENCH REVOLUTION, EDUCATION DURING THE.)

CONDUCT.—We can hardly think of conduct without thinking of character, yet we oppose one to the other, as we oppose character and intellect, character and circumstance. The one is not what the other is. Character is within a man; conduct is without. We can observe another man's conduct, but not his character; we can only infer what this is from his conduct.

We may take this popular conception of conduct as a starting-point from which to proceed to consider what conduct is, and what it includes.

Conduct is all that external action of a man's body which proceeds from his will. His reflex actions are not conduct; whether his instinctive actions are, depends on whether or not these involve will. When a child shrinks or hides himself, the

action is instinctive, yet because it also implies impulse, it implies the lower level of will. Actions that are the outcome of emotion are clearly included in conduct, though these, too, are impulsive and, in part, the effect of instinct.

In the conception of conduct, there is, then, involved a reference to the centre of character—the will. Can we then still maintain the popular conception of conduct as something external to a man's mind, and therefore completely exposed to observation of other men. For external action as such does not amount to conduct, but to it there must be added the internal action of the will as cause, and this is not exposed to such observation.

Whether we must include in conduct the expression of the emotions as well as their behaviour is doubtful, because so much of it is sudden and involuntary. It is remarked that while a man may smile to conceal his anger or hate, it is difficult to change the expression of the eyes. The faces of secret and treacherous men become like masks, which reveal little except the unnaturalness of their expression. It is then only the artificial and voluntary, not the natural expression of emotion, that can be included in conduct.

What is Conduct? We may next consider how far a man's words must be included. Are not his promises, whether or not he fulfils them, a significant part of his conduct, and many of his statements, whether true or false? Yet here the only external actions are the spoken or written words; while the meaning they carry is an inference about the mind and character of the agent. It is this meaning, so far as connected with the will, which alone makes them conduct. A deliberate lie is conduct, as is every voluntary promise, agreement, or contract. Suppose that a man does not keep his promise, his failure may be due to events over which he has no control. He may also resolve not to keep it, and this omission would be certainly regarded as conduct, being due to the will. He may also forget to keep it, and sometimes his forgetfulness may amount to negligence. For if he had made his promise with seriousness and sincerity, he would probably not have forgotten it. This negligence on his part is held to amount to conduct. Yet there is here no direct action of the will, only omission of the action consequent on it. But it is thought that this omission is itself voluntary, and that the man might have prevented it by taking his promise more seriously. For it is not the bare omission which is conduct, but the kind of omission it is.

What is noteworthy in this example is the complete breakdown of the ordinary conception of conduct. There is no external action, and no direct action of the will to constitute it. In place of what we can see, and what we can infer with tolerable certainty behind it, we have a doubtful inference as to the man's previous state of mind, and the capacity of his will to have done what it failed to do, and the quality of his character—his levity or insincerity. And as without there is no external action, so within there is also omission of the will to act, and omission of some quality of character; for the man's will in making his promise was not sincere or not earnest; and out of this double omission is constituted his conduct.

It is, then, clear that the popular conception of conduct is not one that can be applied consistently. It leads into difficult and doubtful investigations. For what we call conduct is mixed up with assumptions and inferences about the mind and character

of the agent; and, in a given case, we cannot tell beforehand how much of this there is, and how much of it is doubtful or false. The difficulty of deciding what is conduct is often due, not to the difficulty of observing the external action, but to the difficulty of inferring correctly what is in the mind and character of the agent. In many cases, only a small part of what we call a man's conduct is susceptible of our observation. Hence it is difficult to define conduct. It includes both a man's actions and omissions, so far as these are directly or indirectly due to his will. This opens up the question in what sense the will is here to be understood, and whether the omission of the will to act can be regarded as voluntary and due to a prior volition where it consists in forgetfulness. The question "What is conduct?" is one of a number that lead to prolonged inquiries, and give rise to great differences of opinion. In following them out, we are apt to forget what importance they have.

The Importance of Conduct. The conduct of a man is important from two points of view: first, because it seems to give us the base of fact from which we may proceed to interpret his character; secondly, because it includes a part of his actions or omissions to which moral praise or blame may be attached, and therefore gives us a base of fact from which we may proceed to judge of the moral worth of his character. From the first point of view, conduct has not the importance attributed to it, because it affords us neither a sufficiently wide nor a sufficiently accurate and trustworthy basis of fact. It does not afford us a sufficiently wide base, because it excludes the involuntary expression of the emotions, which are an important clue to the understanding of a man's character. Further, a man's statements about what he loves and hates, what he excuses and condemns, what he admires and ridicules, are also important clues to his character, but would hardly be classed as conduct. Neither does it afford us an accurate and trustworthy base for the interpretation of character, because it confounds in the meaning of the term "conduct" the external actions of a man with assumptions and inferences about the very thing to be investigated, namely, character; and this we have proposed to deal with only after we have accumulated the kind and amount of facts we require for the purpose. Hence we must not start from what is called conduct if our aim is to reach a full and accurate estimate of character; but we must start from a man's external actions alone, and from such of them as we judge fruitful for our purpose. To these must be added later the expression in language of his thoughts and character, but as subject to testing and verification.

From the second point of view, that of forming a moral estimate of a man's character, we must also start from his external actions. For what we call conduct is here, too, a dangerous base, because it assumes the action and responsibility of the will; and we are generally inclined to assume that men's wills have more power than they have, and hence to form harsh judgments about them. Of these two points of view, the first is specially French; the second, English. Hence great French biographies are full of psychological observation and insight; and English, of wisdom and moral judgment.

With regard to our own characters, internal observation of the action of the will, the emotions and thoughts are the chief base of the understanding.

of ourselves and, through this, of insight into other men, by which alone we can form just hypotheses for the interpretation of their actions.

A. F. S.

CONFERENCE OF TEACHERS, LONDON COUNTY COUNCIL, ANNUAL.—(See LONDON COUNTY COUNCIL, ANNUAL CONFERENCE OF TEACHERS.)

CONFIRMATION.—A sacrament of the Christian Church, as the means whereby baptized persons are *confirmed* (strengthened) by the gift of the Holy Spirit. In the early Church it immediately followed baptism, and was spoken of as the "laying on of hands," which had been a symbol of blessing and ordination in Jewish times. Though there is no record of its institution, the Acts of the Apostles show that the Apostles laid their hands on newly-baptized persons; and many passages in St Paul's Epistles evidently refer to confirmation. In the Western Church, the age at which it is administered varies considerably, and only bishops administer it. In the Holy Orthodox Church of the East, priests are allowed to administer it, but only with Chrism already consecrated by a bishop.

CONFUCIUS.—Confucius was born (551 B.C.) into a world of political unrest, so he naturally emphasized order or peace; but as a statesman he met with little success, whereupon he retired and paid his whole attention to instruction or education. His fundamental doctrine for the attainment of order is centred in the words *Ming-Ming-Tuh*, which are equivalent to "the Development of Natural Virtue." Although the profundity of his teachings justly gave him the title "The Great Sage," yet he himself only claimed to be "a transmitter and not a maker"; hence, according to the classical pedigree of China's illustrious men, he is next to the last in point of time—Yao, Shun, Yu, Tang, Wen, Wu, Chow Kung, Confucius, and Mencius. As a great teacher, he collected and compiled China's ancient institutions into four special works, known as the *Book of Odes*, the *Book of History*, the *Book of Changes*, and the *Book of Rites*. He wrote the *Book of Filial Piety* and the *Spring and Autumn Annals*, while his followers wrote the *Four Books* about his teachings. These contributions became in time, and remained for many generations, the foundation of the Chinese education. During the Han Dynasty, about seven centuries after the Great Sage, the Confucian Classics became the standard of State philosophy. The veneration was so great and intense, that the content of education was confined within the limits of the Confucian doctrines, and the consequent lack of liberal spirit shown by the followers did much to make "Confucianism" the "Ciceronianism" of China.

What He Taught. It has been observed that inasmuch as Confucius directed the attention of his contemporaries and followers to the ancient institutions of China, he directly restricted the liberal tendencies of Chinese thought. However, by a careful examination of his tenets, there are many evidences to prove the dynamic force imparted in his teachings. It is true, he did advise his disciples "to study the old in order to discern the new," and "to examine the cause and effect of great historical events so as to predetermine the

interrelation of events a hundred generations hereafter." Even in these two statements we could see that the emphasis was laid upon "the new" and "the hundred generations hereafter." But in some of his more positive statements he urged the principles of "everyday renewal, day-after-day renewal, and again, daily renewal," and of "investigating unto the utmost of things." Evidently, it was the failure of his followers to lay hold upon such teachings and the subsequent emphasis paid to a conventional type of literary style that retarded the normal progress of Chinese thought. The following passages embodying apparent educational principles are given in order to vindicate the soundness of his early teachings—

"Learning without thought is labour lost;
Thought without learning is perilous."

"I teach not until knowledge is desired;
I help not until it is needed;
I explain no further when the remaining
three corners are unfound
When the first corner was shown him."

"In instruction there is no distinction."

Yen Yu said of him: "The Master kindly leads me step by step."

Confucius was the greatest teacher China ever had, and despite the failure of his followers to live up to his teachings in spirit, without him the ancient teachings and institutions could not have been so well conserved for the succeeding generations. In short, Confucianism is the backbone of Chinese culture. Y-S. T.

CONIC SECTIONS, THE TEACHING OF.—Before starting the study of conic sections, students must be well grounded in elementary mathematics, so that their knowledge is not only sound, but ready. It is far better to postpone the subject than to teach it to a class to whom it is an effort to realize that the base angles of an isosceles triangle are equal, or that $\sin^2 x + \cos^2 x = 1$. Otherwise there is tiresome delay over non-essential points of the proofs, and the main thread is apt to be obscured. The treatment of similar figures can often be made much clearer by giving to equal ratios their proper trigonometrical names, so that these ought to be quite familiar.

Treatment. The subject should be treated from as many points of view as possible, simultaneously, or, at any rate, in rapid alternation. We may start from the plane section of a cone, deducing the focal and bifocal properties by elementary solid geometry in the first lesson, and obtaining the Cartesian equations in the second, the general nature of the curves being discussed in both. Each succeeding property should be proved by whatever method suits it best—plane or solid pure geometry, analytical geometry with Cartesian or polar co-ordinates, orthogonal or conical projection. In general, theorems which fall into a natural group can be proved on the same lines. Alternative proofs are useful, sometimes to bring out the strength or weakness of a particular method, sometimes to illustrate the correspondence between the geometrical and algebraical processes. The exact range and limitations of each theorem and of each proof must always be understood, and the modifications of figure and demonstration for the different species of conic must often be traced out in detail. Naturally, it saves time to prove as many

properties as possible for the general conic; but the parabola is so simple and beautiful, both in its pure geometry and in its algebra, that it may well receive a disproportionate amount of attention. Imaginary elements should be introduced early, as soon as the other new ideas have grown familiar and the student's mind is ready for a fresh adventure. The methods of transformation (projection, inversion, reciprocation) should be used as much as possible. Reference should occasionally be made to curves of higher degree and class; this will probably have been done already in connection with the plotting of graphs such as $y = x^2$; but, where this side of the earlier work has been over-emphasized, it is worth some labour to drive it home that very little can be proved at this stage by the most accurate plotting, though much may be suggested by it. Figures drawn with elaborate accuracy should be avoided except on rare occasions. This is partly to save time: it is better to draw two rough figures for the ellipse and hyperbola than a very neat figure for one species only. But, also, the habit of relying on a good figure, that is, of using the eye rather than the imagination, is a drawback in plane, and fatal in solid, geometry; and there is much valuable training of judgment in learning to draw quickly quite rough figures which are strictly correct in their essential descriptive properties, or which illustrate the assumptions and steps of a piece of analytical work. Models are seldom worth the time they consume; but the worst one made by the student himself is of more use than the most elaborate exhibit.

The study of conic sections ought to be thoroughly enjoyed by everyone who takes it up. If it is to be painful and laborious, the time and energy would be better spent on other branches of mathematics; and the pupil who merely wishes to pass an examination is more than usually impertinent in approaching a subject which makes so strong an appeal to the enthusiasm and romance of the real student.

H. P. H.

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CONSCIENCE CLAUSE, THE.—This is the general form of reference to Section 7 of the Elementary Education Act of 1870, and its provisions are applicable to all public elementary schools. Up to 1902 there was no other, but Section 4 of the Education Act of that year made similar provisions applicable to all schools or colleges supported partly or wholly out of the funds of the Local Authority.

The Clause forbids compulsion in reference to a child's attendance at any religious observance or instruction "in the school or elsewhere," and reserves to the parent a complete power of withdrawal therefrom. The religious exercise can take place only at the beginning or end of a school meeting, and must be recorded in the time-table. A copy of the Clause "shall be conspicuously put up in every (public elementary) school," and the observance of its provisions is one of the conditions upon which the annual Parliamentary grant is dependent.

A. E. L.

CONSCIOUSNESS, THE STREAM OF.—Explanation of a *sumum genus* such as consciousness cannot begin with a definition, but may be aided by

an analogy. Professor William James chose that of a stream to suggest two principles, viz.—

1. Thought is constantly changing, but the mental content of one moment merges gradually into that at another without any sudden break.

2. Within the consciousness of each person, thought feels continuous; and, even after a time-gap, such as sleep, has no doubt of its identity with the previous thinking self.

Professor Bain said that the "stream" of thought was not a continuous current, but a series of distinct ideas passing through the mind. It was against such a conception that James wished to guard, and suggested that consciousness, so regarded, should be compared to a chain composed of separate links rather than to a stream. In following up his own analogy, he speaks of the *pace* of the stream of thought, and of the fact that its *direction* is determined by interest.

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CONSULAR SERVICE, EDUCATION FOR.—(See PUBLIC SERVICES, EDUCATION FOR THE HIGHER).

CONSUMPTION IN CHILDREN.—(See TUBERCULOSIS IN CHILDREN.)

CONTIGUITY, ASSOCIATION BY.—(See ASSOCIATION, PSYCHOLOGY OF.)

CONTINENTAL COLLEGES AND UNIVERSITIES, BRITISH STUDENTS AT.—Continental schools first surpassed British through Alcuin's aid. French monasteries trained some British scholars; and, when Abelard's fame attracted crowds to Paris, "*Anglorum turbam juvenum mare non terrebat*." By 1220, four organized "nations" existed: French, Normans, Picards, English; by 1450 the last had become a tribe of the "German nation," many Englishmen seceding (1229) to the younger *Studia Generalia* (Toulouse, Reims, Angers). Each "nation" had a quæstor and special statutes. Art and theology were the chief studies at Paris; law and medicine at Padua (Anglo-Scottish Nation, 1222–1738). Orleans (law) had a Scottish nation; Caen University was created by Englishmen (1437); Prague and Vienna felt their influence. At Paris, the English Bachelor had to be aged 20, and have studied four years; *Doctores Theologiae*, fifteen. Students lived in colleges; Stephen of Lexington founded the C. du Chardonnet (1246); David, Bishop of Moray, the C. des Écossais (1326). Budinszky names 160 eminent British Parisian students and teachers, including John of Salisbury, Walter Map, Roger Bacon, William of Occam. (See H. Rashdall's *Mediaeval Universities*.)

History from A.D. 1500–1800. The flow of English students to the Continent partly ceased after Grocyn, Linacre (M.D., Padua), Colet, etc., brought the New Learning home from Northern Italy. Desire for adventure, hatred of England, love of France, carried many young Scots to Paris, the Netherlands, or Germany, whither Luther and Melancthon attracted Alesius, Patrick Hamilton, and Tyndale (last two both at Marburg). Coverdale spent years abroad. Buchanan, Bellenden, Leland, Leslie, and Aytton studied at Paris; William Harvey and Sir Thomas Browne at Padua, Browne also at Montpellier and Leyden (M.D.), where Toland studied theology, Fielding law, Akenside medicine;

Goldsmith, idle at Leyden, graduated at Louvain or Padua; Chillingworth was at Douay (1630), where Lingard studied ten years (English College); Robert Barclay was at the Scots' College, Paris; Lord Monboddo (Gröningen), Herbert Marsh (Leipzig), Thomas Young, and Coleridge (Göttingen) chose Germanic universities, Coleridge bringing home the new Kantian philosophy. About 1736, Utrecht students were one fourth British, Low Country universities having long sheltered our Puritans. Irish Catholics, driven from home for centuries, studied and taught at Paris, Nantes, Amiens, Douay, Lisbon, Rome, Freiburg (Father Prout), Prague; above all, at Louvain and Salamanca (*El Real Colegio de Nobles Irlandeses*, f. 1605, still extant). (See the histories of these universities and the *Dictionary of National Biography*.)

History from 1800. Paris was Europe's centre of scientific thought till about 1830, and, since 1890, foremost in history and philosophy (Sorel, Gaston, Paris, Viollet, Aulard, Bergson; cf. *Quarterly Review*, No. 443). Her guests included Lord Kelvin (Regnault's laboratory), Sir J. Crichton-Browne, H. R. Kenwood, D. Nichol Smith, and some living historians; some medicals went to Paris, Vienna, or Italy before 1800, when medical education barely existed in England. Germany became popular about 1830. Of living F.R.S. about 28, of professors 50, of secondary schoolmasters 3 per cent. have studied abroad. Our list, while not exhaustive, illustrates their distribution: Göttingen had an English colony before 1800 and long remained first favourite; it attracted Finlay, Lever, Pusey, Blackie, Sir W. M. Ramsay, Lord Haldane, L. P. Jacks, James Sully (see "Göttingen in the Sixties," *Hibbert Journal*, No. 50). Berlin, overtaking Göttingen, drew Pusey, Blackie, Martineau, Beard, Tyndall, Sully, Sir William Osler, Sir Philip Magnus, J. H. Morgan, A. W. Crossley. Blackie discovered "what learning really was" from Heeren, Schleiermacher, Neander, etc.; Martineau owed his "new intellectual birth" to Trendelenburg. In Liebig's laboratory, at Giessen, English students were outnumbered only by Germans. Tyndall, who with (Sir) Edward Frankland attended Bunsen's lectures, graduated Ph.D. at Marburg (later frequented by philologists and theologians). The following studied at: Heidelberg—Lord Bryce, W. A. Curtis, R. T. Glazebrook, A. T. Baker, W. A. Bone, F. R. Japp; Bonn—1st Earl Lytton, Pusey, J. A. Cramb; Leipzig—Sir A. Geikie, G. A. Smith, W. A. Curtis, Alfred Smith, J. G. Robertson, A. D. Waller, J. J. Findlay (also Jena), W. P. Paterson (Erlangen, Berlin), John Adams; Tübingen—G. A. Smith, Sir William Ramsay; Vienna—Alfred Smith, Sir William Osler. At Munich, Lord Acton learnt from Döllinger "to look at everything from the historical point of view." A few students, like Geikie (Uppsala, Prague), penetrated other lands; Mme. Montessori attracted some to Rome. Many have been assistants (men and women) at French *lycées* or German *gymnasien*; lecturers at German or Scandinavian universities; taken *Licences*, *Doctorats* (France), Ph.D. (Germany, Switzerland), or technical courses at Paris, Charlottenburg, Zürich, etc. Scores of language students were trained in phonetics, etc., by W. Tilly (Marburg, Berlin), or followed holiday courses. George Meredith, H. Morley, W. S. Macgowan were at school at Neuwied.

Practical Information and Statistics. There is a somewhat excessive tendency to concentrate in the

largest universities, notably in Paris, which, in 1909–1910, had, out of 976 foreigners, 110 British students (15, "Droit"; 1, Medicine; 1, Pharmacy, 6, Science; 97, "Lettres"). In 1906–1907, 2 Englishwomen graduated D. ès L.; 3, D. d'Université; 10 men and 29 women received *Certificats d'études françaises*; 13 men and 11 women were not preparing for examination; at Poitiers 1 Englishwoman received the *Certificat d'études françaises* in 1910. At Berlin the British numbered 137 in 1891–1892, 47 (8 women) in 1911–1912, nearly all in the Philosophical Faculty. Giessen attracted only six Englishmen in 1908–1914.

Students going abroad should consider that they can have more attention at small universities, some of which are excellent. Entrance is open to all of matriculation standard, but proof of having reached this is required. A British degree sometimes carries privileges. French universities offer foreigners special courses. Students should write to the University Secretary before arriving, and take their passports, birth certificates, diplomas, etc.

M. MONTGOMERY.

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CONTINUATION CLASSES.—(See CONTINUATION SCHOOLS AND CLASSES, EVENING.)

CONTINUATION SCHOOLS, DAY.—Under the Education Act of 1918, children who leave the ordinary day school at the end of the term after 14 years of age will, after the "appointed day" (not yet fixed by the Board of Education), have to attend during working hours a day continuation school for 320 hours a year until they attain the age of 18. For the first seven years, however, after the appointed day, attendance will be compulsory only up to the age of 16. For the purposes of the Act, such pupils are described as "young persons."

This gives local education authorities an opportunity for which they have been working and waiting for years—the opportunity to have some oversight of young persons during the period of adolescence; and, while by giving us (parents, educationists, and teachers) that opportunity, it places upon us a grave responsibility, and one which we must not shoulder without serious thought and a willingness to learn as we teach. We must approach our new duty with an open mind; but I think that upon one thing we must all be convinced, that if the day continuation school is to be a success, whether on a voluntary or compulsory basis of attendance, "interest" must be the key-note.

The main object of the day continuation school will be the preparation of the young person for the realities and responsibilities of life. It will not be the mere imparting of knowledge as such, nor will the aim be to turn out a number of *scholars*, but rather to train the young persons to a common-sense appreciation of themselves and their surroundings. In short, the object is to turn out more capable and thoughtful citizens. The young persons should be taught to realize that the education of a sentient being cannot cease—that it must necessarily be coterminous with life itself. When this feeling is established, life becomes a joy as each day brings its new interests and enlightenment. By

interest, we must create a lasting craving for improvement.

Teaching in a Day Continuation School. The teaching in the day continuation schools must necessarily be entirely different from the formal teaching which obtains in the day school. The students will be young persons passing through one of the most difficult periods in life, who are preparing for that vocation which will ultimately be their means of livelihood; by keeping them in touch with the "humanities," apart from materialist knowledge, the day continuation schools will go far to achieve their object. The teachers will have to realize that these young persons are not just boys and girls, but young men and women who will very quickly develop into adults. They will have to appreciate the varying difficulties in the social life of their pupils, to understand their outlook, and to know the industrial world to which they belong. They will guide them sympathetically along the path of their training as citizens and workers. The ideal teacher will always have in mind the fact that his pupil is to be a citizen first and after that a worker.

The teachers must have three essential qualifications: (1) Knowledge of his subject; (2) enthusiasm; and (3) the spirit of inspired leadership.

On each day of the week, and at each lesson, he will have a different set of faces in his class—a class whose interest he will have to secure and sustain throughout the lesson. An ordinary class teacher, meeting the same class day after day, can get some relaxation from the strain of teaching by allowing his class at times to work alone. Not so the day continuation school teacher, who must be alert the whole of the time and be continually instructing and guiding. His teaching hours should not exceed twenty a week, but he should be prepared and required to give up at least another ten in helping to establish and maintain a healthy corporate life in the school by interesting himself in the various school societies, games, and social activities after the hours of formal instruction are over. Above all, "the teacher should be able to associate with the young persons in a spirit of unaffected friendliness and to establish among them an educational fellowship rather than an autocratic discipline."

Probably the most difficult question to be faced in starting day continuation schools will be the question of teachers. It is not suggested that a large number of qualified teachers or persons with academic qualifications will be available or, indeed, essential; and it is hoped that from amongst those who have been performing social work and war work during the last few years, there will be many who can be recruited as teachers of day continuation schools.

Curriculum. The curriculum should be as fluid as possible, and will necessarily vary with the needs of the schools and aptitude of the students in each locality. The essential is that the curriculum should be attractive to a degree and entirely free from drudgery. The majority of young persons who have shouldered the responsibility of wage-earning and who, with that responsibility, have realized a certain amount of self-importance, must not be made to feel that they are leaving wage-earning for rigid schooling. Rather, the curriculum must be so designed as to make them feel and know that every hour spent in their day continuation school will be a means of helping them to take their right position in life.

Generally speaking, the curriculum may be divided into three parts: (1) Physical training and practical work; (2) formal teaching of English and kindred subjects; and (3) social activities.

I put physical training first, because, unless our young persons have healthy bodies, they will not be able to take full advantage of the instruction offered to them. The physical exercises and games will serve not only to keep body and mind fit, and create energy for work, but to form character and inculcate an ardent desire for, and power of, self-government. It is not every boy and girl who will be physically capable of entering fully into this portion of the curriculum; and, therefore, their particular recreative bent must be discovered, and they must be encouraged and guided to use that bent to the best advantage. At the same time, even in their case, physical culture must not be neglected.

The practical work will, as far as possible, have a technical bias and give the young person the opportunity of acquiring the knowledge best suited to the needs of the locality and to his or her own particular aptitude. It must appeal to the imagination and, as far as possible, be an outlet for that often pent-up enthusiasm for "doing things" which the average young person possesses, but which he is unable to exercise properly for want of proper guidance and material. The practical work opens out a wide field of opportunity for the ardent teacher, for it is often on this side of the curriculum that one can influence a student for whom no other branch of study has the slightest attraction. In framing our scheme of practical work, we must always remember that our efforts are not mainly to produce efficient units in the industrial system, but to educate mind and character. It will, however, be possible to so design our practical work as to include educational courses preparatory to special training for local industries, and in this sense only should it be vocational.

Of course, the basis of the curriculum should be history, literature, and geography; and out of those subjects can be developed a sense of personal, local, and national patriotism. This does not mean a recapitulation of the work already carried out in the day school, but an amplification of that work with a view to broadening the intelligence. I suggest that in these subjects a definite standard of learning should not be the goal; the end should be to create a love of reading and a desire not only to retain the lessons already learnt at school, but to stretch beyond for further knowledge and general culture.

The Social Work. The social work will be on very general lines, and may include such subjects as music, literary and dramatic societies, debates, natural history societies, photographic societies. The social training will necessarily vary with the moral and social outlook of the teachers, but a great deal of good may be expected from it if it is placed in the hands of capable people.

Attendance. It is suggested that students should attend on one day per week with every fifth Saturday morning. It is, therefore, proposed that the school be open daily in the morning from half-past 8 to 12 o'clock, and in the afternoon from half-past 1 to 5.

This will give an average weekly attendance of 7·7 hours. Forty-two weeks will then give 323·4 hours. Probably the school will be open for forty-four weeks, which will give 338·8 hours. A five weeks' holiday at Midsummer, and a

re-arrangement of attendances so that each student attends for a week continuously, would give opportunities for a school camp.

Time-table. The following subjects are essential: (1) Physical exercises and games; (2) English (including history, geography, and literature); (3) mathematics and science, handicraft and arts.

For a normal student, bearing in mind that each half day must be complete, the following approximate allocation of time is suggested—

Boys.		Hrs.
English Subjects		1½
Mathematics and Drawing		1
Physical Exercises and Games		1
Science		1½
Handicrafts		1½
Literature and Music		½
GIRLS.		Hrs.
English Subjects		1½
Arithmetic and Accounts		1
Physical Exercises and Games		1
Domestic Science		1½
Handicrafts		1½
Literature and Music		½

For the present, it is suggested that no formal time-table be prepared for Saturday mornings; but that the students may, with the approval, and under the supervision, of teachers, have opportunities for following their own inclinations either in the handicraft room, the laboratory, or in English where those who possess aptitude may do some drama work.

Details of Curriculum. The following outline is intended to indicate the general aim at the moment; but, as the whole is an experiment, it might be modified considerably from time to time.

ENGLISH. (*Boys and Girls.*) The teaching of English will have a threefold object—

(i) The acquisition of new ideas, through the medium of books and lessons, especially of the great movements in history which have produced the present social, economic, and industrial conditions. The development of the main industry of the district will be treated historically with the effects on other British industries. Geographical conditions and simple economics will be treated incidentally.

(ii) The development of the power of self-expression in speech, reading, and writing. To this end, graduated exercises will be arranged in the form of written work, frequently varied by discussions, free and open conversation between students and teacher, and occasional formal debates.

Neatness, spelling, and punctuation will not be neglected, but the principal aim will be to get the students to express themselves lucidly, easily, and with originality of thought. Formal grammar and verbal errors may be treated incidentally, but the chief stress will be laid on general proportion and proper arrangement of ideas. At the same time, our instruction should so far bend to public opinion as to remove the prevalent criticism, sometimes justified, that our schools turn out large numbers who can neither write legibly nor spell correctly. In the case of some of the better students, this section will develop into the study of one foreign language.

(iii) The training of the appreciation of the beautiful in literature, music, and art. In this section, an endeavour will be made to choose the most vivid, human, and dramatic literature, in order to supply such food for the imagination as will correct the starved and meagre condition of mental life which has generally been the lot of the adolescent wage-earner. The work in this section should stimulate extra activities outside the normal time-table. Opportunities will be given for discovering the line of students' interests, and instruction should be intensified along this line.

PHYSICAL EXERCISES AND GAMES. (*Boys and Girls.*) The greater part of the time for this subject will be devoted to organized games in the playing-fields. Some of the time will be taken up by systematic courses of physical exercises in the open or in the gymnasium (together with simple talks on physiology). Natural history societies, scout troupes, etc., will aid physical development.

SCIENCE. This will be presented to the students as the sum of great human strivings after improvement. In an engineering district, it will have a considerable engineering bias, and should, therefore, start with the historical evolution of the lever, wheel and axle, pulley, inclined plane, and screw. This should lead to the use of wind, water, heat, and electricity; and, finally, the evolution of steam, internal combustion engines, and the methods of producing electric power, the whole being treated more or less historically so as to bring in the human element. Laws of mechanics, physics, and chemistry will be dealt with as they are historically evolved and formulated. For girls, science will have a domestic bias leading to formal instruction in laundrywork and cookery.

MATHEMATICS AND DRAWING. (*Boys and Girls.*) This will be treated as a combined subject, and follow the course of science teaching. As scientific principles are formulated, mathematical methods will be applied to them.

HANDICRAFTS. The course in handicrafts will be designed so that a student will be able to work out his ideas in the medium best suited to his taste and ability. He will not, for example, be compelled to carry out a formal course in wood before proceeding to metal or other medium. He will proceed to work in wood, metal, leather, cardboard, clay, etc., according to his taste and ability. There will be a further bifurcation in this course. Students who show artistic ability will be directed to the development of this faculty in decorative work, while those who show mechanical ability can develop it in close connection with the science course.

Handicraft for girls will consist principally of needlework; those with artistic ability will be directed to develop this faculty in decorative work, while others will spend most of their limited time on more useful garments.

At the same time, it is desirable that girls who show aptitude should have opportunities for book-binding, leather work, repoussé work, and so on. Girls, like boys, should have opportunities of working in the medium most suited to their tastes and ability.

R. T. H.

CONTINUATION SCHOOLS AND CLASSES, EVENING.—A few years ago, the continuation school was the most pathetic thing in English education. Exhausted pupils were taught by exhausted teachers on the basis of an exhausted

educational tradition, which, regarding adolescents as still "boys" and "girls," treated them to a *réchauffé* of "Standard V" methods, relieved by a little woodwork, needlework, or gymnastics. It was a pitiful failure in almost every respect. No one's mind was made up as to whether the work should be vocational (trade), non-vocational (cultural and recreative), or both; teachers were unfamiliar with the problem; and teachers and pupils were alike physically unable to do serious work at the end of the day. Only one motive was found strong enough to attract large numbers of students to evening classes—the motive of immediate success in the lower ranks of commercial life. The higher branches of commercial work attracted few candidates; while it was only in the North of England, and in connection with a few staple industries, that technical education played any important part in evening continuation work.

Historical Development. A few dates in the history of evening schools in Britain may be given—

- 1780–1833. Sunday School work; Robert Owen's experiments; Denominationalist efforts; Adult Schools; First Government Grant for Education.
- 1833–1848. Work of Anderson, Birkbeck, and William Lovett begins to bear fruit; Mechanics' Institutes; Y.M.C.A. (1844).
- 1848–1870. Working Men's College (1854); Influence of Carlyle, Ruskin, and Spencer; First Government Grant for Evening Education (1851); Polytechnics (Quintin Hogg), 1864 and onwards; Education Act: since 1870, increasing State support has been given.
- 1880. Grants not to be confined to the "3 R's."
- 1893. Mr. Acland's Code.
- 1905. Organized "Courses" introduced at Leeds.
- 1906. Organized "Courses" introduced at Manchester.
- 1913. Re-organization of the London system.

Several distinct influences, towards the beginning of the twentieth century, led to a serious, though tardy, concentration of attention on the present problem. Foreign competition had begun to disabuse the nation of the idea that the easy-going and empirical methods of the past would suffice in the commerce and industry of the future. "Blind-alley occupations" had begun to be found out, with the result that "After-Care" and "Juvenile Advisory" organizations were set up. Lastly, Dr. Stanley Hall's large book on Adolescence had supplied the teacher, if only he had realized the fact, with a working "psychology of the evening school." Meanwhile, experiments on a vocational basis were being made in Munich and in other parts of the European and American continents. The principle underlying them was, while making the adolescent's daily occupation the centre of his further education, to instruct him in the mother-tongue and in citizenship. The important distinction between an "organized course of study" and the narrow study of a single subject was thus established, and in the North of England the advantages of the former were soon recognized.

London. London, meanwhile, had been more or less left behind. Proprietary institutions were teaching shorthand and modern languages; the City and Guilds of London Technical Institute and the Society of Arts established examinations in technical and commercial subjects; and a number

of L.C.C. evening schools were organized into commercial institutes and did good work. In 1913 the whole scheme of evening education in London was overhauled at the initiative of Sir Robert Blair, and what may fairly be regarded as an administrative or bureaucratic triumph may be said to have been achieved. Among the most important features of the scheme may be mentioned: (1) the Junior Technical and Junior Commercial Institutes, in which organized courses, based on the daily work of the students, are in operation for three nights a week; (2) the improved status of the Senior Commercial Institutes. There are also Free Institutes (since 1914, charging a fee of sixpence) for poorer students; and Literary (non-vocational) Institutes, which have attracted people wishing to study subjects of a cultural character. Elaborate arrangements have been made to link the work of the Junior Institutes with the day schools and with Senior Technical and Senior Commercial Institutes. Relations with employers have also been established; and lectures to teachers, to improve the quality and suggestiveness of the instruction. In short, the scheme has laid broad and firm foundations on which an edifice of compulsory continuation education can be erected. The chief weaknesses of the scheme are mostly incidental to the students coming voluntarily, and after a day's work. Regularity of attendance and full intellectual vigour cannot, therefore, be expected. Despite these handicaps, the attendance has shown a stability that, several years ago, would have been deemed impossible.

Modern Tendencies. A rigid separation between vocational and non-vocational work was necessary in the early stages, in order that the principals and instructors might acquire definiteness of conception and aim. Sooner or later, however, this separation may be broken down; every evening institute will then stand for both of the "two L's"—Livelihood and Leisure—which sum up the educational purpose of "complete living." The policy by which a junior student's instruction is grouped entirely around one occupation only may also have to be revised. Equally important is the fixing of a certain standard of attainment in day schools, in order that evening work may be genuinely continuative and not merely recapitulatory.

Another controversial question is whether evening instruction should be *free*. As a rule, "students appreciate what they pay for," and free students are usually the least satisfactory ones in such institutions. The truth appears to be that, in modern society, *tout se définit par des monnaies*, and will continue to *se définir* until a system of moral or civic instruction (conveying a sense of relative values) is brought into existence. F. H. H.

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CONTINUATION SCHOOLS IN GERMANY.—
(See EXPERIMENTS IN RURAL DISTRICTS ON THE CONTINENT, EDUCATIONAL.)

CONTINUATION SCHOOLS, TEACHERS IN.—
Day Continuation Schools. The Education Act, 1918, makes it the duty of every Local Education

Authority to provide in its area a system of day continuation schools for young persons between the ages of 14 and 18 years.

In order to staff these schools, local education authorities have had to consider employing three groups of teachers, viz.—

1. Teachers who have had experience in public elementary schools or in secondary schools.

2. Teachers who have had experience in evening schools (see below).

3. Persons with experience in social work, in commerce, or in industry, who have a desire to take up the work of teaching, and who have a practical knowledge of the conditions under which the young persons spend their working hours or their leisure.

In the day continuation schools which existed in certain works before the passing of the Education Act, 1918, the teachers were mostly drawn from the first of these three groups. They were usually enthusiasts for the social and physical well-being of the youths and girls under their charge. They worked a larger number of hours each week than the teachers in ordinary elementary schools, and received rather higher pay, but were not eligible for a pension as they would have been if they had continued to work in public elementary schools.

It is expected that in the public day continuation schools in the future, teachers will work about the same number of hours per week as in public elementary schools, if employed full-time in teaching. There will probably be, in certain areas, a number of teachers who are employed for only a part of their working hours in school, and who will be engaged either on the craft side of the school work, or on the social and physical-training side.

Scales of salaries will be according to the qualifications and the nature of the work of each teacher. They will probably be rather higher than those for public elementary schools, and perhaps not so high as those of graduates in secondary schools.

Teachers employed "part-time" will probably be paid by the hour, as is often the case in evening continuation schools.

"Full-time" teachers will be eligible for pension on the same terms as those in other schools.

Evening Schools. Teachers in evening schools are usually teachers who desire to increase the income they derive from teaching in public elementary schools, but there are occasionally to be found men or women who combine expert knowledge with a zeal for teaching, who undertake some form of technical teaching in evening schools.

The pupils they have to teach also vary considerably, from the pupil who has either forgotten or not learned what the public elementary school professed to teach, up to the genuine student who uses his leisure in the pursuit of knowledge.

The teachers in evening schools usually have small classes and keen pupils. In spite of the fact that both teacher and pupil come to the school after a day's work; in spite of the further fact that, in general, the schools are equipped with desks for children and not for adults, a great deal of good work can be and is done in evening schools.

Principal teachers of evening schools are usually paid a salary for their administrative services for a whole "session," which begins in August or September and ends in May or June of the following year. Other teachers are generally paid, according to the subject and the length of the lesson, a fixed sum per lesson. This is because classes are liable to become small and may even vanish altogether

when other demands upon the pupils' leisure become too insistent.

Service in an evening school does not, as a general rule, count for purposes of pension.

A. C. C.

CONTRAST, ASSOCIATION BY.—(See ASSOCIATION, PSYCHOLOGY OF.)

CONTRAST COLOUR.—(See COLOUR VISION, THEORIES OF.)

CONVENT SCHOOLS.—From the time of the earliest establishment of convents in the Christian Church, it was customary for education to be part of the religious life of women. In the eighth century the nuns who accompanied St. Boniface in his work of evangelization, established convent schools wherever they went, and a very high standard of education was reached. Chaucer refers to the excellence of convent schools in England, and to their superiority over schools for boys. The convent schools were closed in England by the Reformation, and only one was opened from that time until the nineteenth century.

In 1686, the Bar Convent—the Institute of the Blessed Virgin Mary—was opened at York; it had been founded by Mary Ward, a pioneer of religious congregations devoted to the education of girls. In spite of penal laws and Protestant persecution, this convent survived; and the Institute has now 180 houses in the English-speaking world. After the removal of Catholic disabilities in England, and more especially in the second half of the nineteenth century, many convent schools—both Protestant and Catholic—were established in England. These institutions include many varieties of schools in which education is carried on by religious females (e.g. elementary, reformatory, industrial, and secondary schools). Many of them have been officially recognized by the Government, and are under Government inspection. The establishment of Catholic training colleges and the demand for teachers with academic qualifications have combined to raise the standard of convent education.

Government Inspection. Almost all the convent secondary schools are under Government inspection and "recognized" by the Board of Education. The receipt of an aid-grant carries certain restrictions with regard to admission of pupils; but, in cases where no grant is received, the nuns act more independently. The aim of a convent school is to provide a thorough secular and religious education, and Government inspection secures a degree of efficiency.

Secondary Education. The range of studies in a convent secondary school is wide; and pupils are prepared for all the University Local Examinations, University Matriculation, the examinations of the College of Preceptors, and of the chief musical examining bodies. There are at present over two hundred convent secondary schools in England under the care of about sixty different religious orders. The Institute of the B.V.M. has six such schools, the Sisters of Notre Dame of Namur have eighteen, and the Ursulines have twenty-three. Some of the best known are the B.V.M. schools at York and Cambridge, St. Ursula's at Oxford, and the Notre Dame schools at Norwich and Northampton. Many convent schools carry on the training of elementary teachers, and others serve as practising schools for the students.

There are six recognized training colleges for primary teachers and two for secondary teachers, under the care of the religious orders, in which the Government syllabus is followed and the Board of Education certificate granted.

The Sisters of the Holy Child Jesus have also opened a convent at Oxford, licensed by the University authorities, where a limited number of secular, and an unlimited number of religious students, may reside while following their University course. (See also CATHOLIC (ROMAN) SECONDARY EDUCATION; WOMEN IN THE MIDDLE AGES, THE EDUCATION OF.)

CONVERGENCE (in Mathematics).—This is a term applied to a series of which the sum continually tends to approach a certain fixed limit as the number of terms increases. Thus, the series, $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$ has a sum which cannot exceed $1\frac{1}{2}$; but as more and more terms are included, the total approaches more and more nearly to $1\frac{1}{2}$, and can be made to differ from $1\frac{1}{2}$ by as small a quantity as we choose. The number $1\frac{1}{2}$ is called the "sum to infinity" of this series.

CONVERSATIONAL METHOD, THE.—By this is meant the method of teaching the younger children by conversation, chiefly in the form of question and answer, rather than through books. It is not confined to the younger children; much of the work in history, in geography, in literature, and especially in science and languages, is carried out by this method, to a greater or less extent, according to the school. Its uses in the junior school are various: in the Nature lesson (and where the practice still holds, in the Object lesson) it is most largely used; the children's observation is directed by means of questions towards various aspects of the thing in hand, and the answers show the quality of the observations. In some cases, this is carried to the extent of demanding that each answer shall be framed as a complete sentence. In Arithmetic, ideas are arrived at by encouraging the children to manipulate various kinds of concrete materials or prepared apparatus; and afterwards, by means of this method, leading them to form general rules. Training in the mother tongue is carried on in this way also; by means of pictures, games, plays, puzzles, etc., children are encouraged to express themselves freely; poetry and stories are fully commented on by the class.

Purpose and Scope of the Method. Teachers who practise this method seem to have two aims: (1) To lead the children to discover facts by their own efforts, instead of being informed by the teacher or through a book; (2) to give the children an opportunity to express themselves. In the case of the older children, the first aim is further augmented by a desire to encourage them to analyse facts and, by reconstructing them into general ideas, and to form opinions and theories. The method is a very distinct reaction from the method which preceded it. Formerly, a passage in a book was prescribed and, after the children had gone through the process of what was called "learning their lesson," they were "heard": this consisted in the teacher questioning the children on the passage, and the usefulness of the process varied with the intelligence of the teacher. *Non-intelligence was provided for in the middle of the nineteenth century by the preparation of books with both question and answer. When the framing of the question devolved on the*

teacher, the less intelligent framed them merely on the recapitulation of the verbal matter; the more intelligent caused the child to consider, analyse, and reconstruct. Roughly speaking, the oral method might be described as inductive, while the book method is more deductive; but this distinction does not bear too severe an application. Such are the two extreme methods. While the oral is at present the most widely spread, there is undoubtedly a slight reaction, not exactly in favour of the older method, but of adjusting the balance more truly. There prevailed, and to some extent still prevails, in the minds of many teachers, a very strong tradition that children must on no account be "told" facts, but must be "led to discover them." The theory was often applied without discrimination and intelligence: from it has sprung the much abused term "elicit" and some very absurd situations have arisen in its name. Children have been questioned on matters quite strange to them; they have been led to guess the subject of the lesson, even names of people, on merely verbal clues. An actual example might be cited of a teacher who preceded a lesson on "The Swallow" by drinking a glass of water in front of the class, and then requiring them to name the subject of the lesson by referring to the operation she had just gone through. This method may, however, lead to valuable work by giving sufficient guidance in the form of leading questions to guide the children to independent discoveries. It has more than one source; indirectly, Comenius and Rousseau may have put us on its track in their reaction against the tyranny of the Renaissance. Pestalozzi gave a direct lead, with his object lesson and by his use of the concrete method; Froebel's theory of self-expression gave it another and different value; and, in our own time, Professor Armstrong's advocacy of the Heuristic Method (*q.v.*) has permeated much of the work of the school. Probably we are now beginning to find that the true place of oral teaching is to encourage and guide discovery, and to develop self-expression. There is undoubtedly a time to tell, a time to read, and a time to discover. But education is many-sided, and its ways are manifold.

H. BROWN SMITH.

CONVERSION.—(See ADOLESCENCE.)

CONVERSION (RELIGIOUS)—(See MYSTICISM AND EDUCATION.)

CONVEYANCE OF CHILDREN TO SCHOOL.—

Under the Elementary Education (Defective and Epileptic Children) Act, 1899, local authorities may provide guides and conveyances for children who are, by reason of any physical or mental defect, unable to attend school without such assistance; and the Board of Education have ruled that this power is not limited to children attending special schools or classes, but is intended to cover "the case of children who would otherwise be prevented by some physical defect from attending ordinary public elementary schools."

Under the Act of 1902, local authorities may provide vehicles or pay reasonable travelling expenses for children (or teachers) attending school or college, whenever the authority "shall consider such provision or payment required by the circumstances of their area or of any part thereof."

A. E. L.



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CONVOCATION.—At most universities this is the whole body of the members of the university endowed with power to legislate for the university. At Oxford it is an assembly which enacts and amends all laws and statutes, and elects burgesses, many professors, and other officers. It is composed of all members of the University who have at any time been masters regent, and who, if independent persons, have kept their names on the books of their colleges. At Cambridge, Convocation is an assembly of the Senate out of term time, and a grace converts it into a Congregation. A Congregation is the body of the masters regent, and the Great Convocation is the body of all masters, regent or not regent, and possesses the function of granting degrees, graces, and dispensations. In some universities the constitution and functions are somewhat different, and usually graduates are not eligible for membership of convocation until some fixed period after taking degrees.

CONWAY TRAINING SHIP.—(See **MERCANTILE MARINE, TRAINING FOR THE.**)

COOKE, EBENEZER (1837–1913).—Born at Horning, Norfolk; afterwards removed to Neatishead, where he attended a school, the master of which was a disciple of Pestalozzi.

Coming to London, he joined, in 1855, the drawing class at the Working Men's College conducted by Ruskin and Rossetti, and in 1865 was appointed teacher of the Ruskin Drawing Class at the Working Women's College. "Experience here, and the influence of Pestalozzi and natural science, led him to see that drawing from Nature was not drawing according to Nature; that teaching must rest on human nature, on the child's nature and its development."

In 1875–1876, Cooke became drawing master at Mr. C. H. Lake's school, and here introduced Nature Study instead of science.

In 1877 the Education Society was founded, and in the following year Cooke introduced a paper, illustrated by children's drawings, entitled "The Method of Nature as the Type of All Method, considered in reference to Drawing." It was the beginning of a new era in the teaching of drawing.

About this time Cooke organized the teaching of blackboard drawing for the Froebel Society, and with it, "free-arm drawing, and drawing from knowledge, imagination, and memory." He also gradually invented a system of brushwork with colour and design.

In 1889 he became Art master at the White-chapel Craft School; and in 1895–1896 was invited by the Education Department to draw up "a new alternative syllabus of drawing for elementary schools." A report of the working of this was published by the Education Department, together with an exposition of the principles of free-arm drawing and brushwork by Cooke, entitled *The A B C of Drawing*. It was only a fragment of a complete scheme, a change of Government preventing further progress.

In 1898 Cooke visited the United States to give a course of lessons, and there met and conferred with some of the leading educationists.

In 1900 came the first International Congress on Teaching Drawing, at Paris; in 1904 the second, at Berne, where Cooke proposed the first resolution. At the London Congress in 1908, he gave a special lecture, by request of the committee; and in 1912,

at Dresden, a paper, which had to be repeated by request.

In 1908 he was invited by the London County Council to lecture to its teachers, a function which he continued to the time of his death; and in 1909 he took part in the London County Council conference on the teaching of drawing, of which he drew up the minority report.

In 1910 he presented a paper on "The Teaching of Design" to the members of the Society of Arts.

In 1913 the Government conferred an annuity on him "in recognition of the valuable work done towards the improvement of Art teaching," but his death occurred before it came into operation.

He died suddenly, in the interval between two lessons, at the age of 76, the cause being heart failure. "A teacher he remained to the end."

A. COOKE.

COOKERY, THE TEACHING OF.—Cookery is usually considered the most enthralling, and certainly the widest, of all the domestic subjects. It is an art the mastery of which is never fully achieved by those who study it; war proved this, for the most experienced in the preparation and cooking of food were obliged to learn how to deal with substitutes necessary through the compulsory rationing, and how to make and serve as many varieties of meals as possible to ensure a fairly correct proportion of the food-stuffs needed for a healthy growing human body.

Big-scale cookery came to the fore during the years of war, and even the best cooks had to turn their energies to making quantities and portioning out cooked foods in order to supply the right amount for the money paid, and for the food value needed.

Those who set out to learn cookery must come under one of three heads, viz.: (1) Those who learn it for utilitarian reasons, for their own homes; (2) those who learn it in order to teach it to children in elementary schools, girls in secondary, private, continuation, and high schools; (3) those who learn it in order to gain a livelihood other than by teaching. The methods of teaching cookery must vary for each of these three divisions of the community.

Before going into these separately, it may be well to understand clearly what a thorough knowledge of cookery, considered as an art and a science, involves.

A cookery expert must show manipulative skill and dexterity and must possess knowledge of: Physics, Chemistry, and Physiology, in order to understand the boiling points of liquids, the action of heat on foods, terms such as solution, suspension, evaporation, the changes various foods undergo during cooking, the growth and activity of yeast, the classification of food stuffs, the function of each in the body, and proportion of each needed for people of different ages, living in different climates, and having varying occupations, the digestive system, and the chemistry of digestion and absorption of foods. She must know how to choose and buy every kind of food, having regard to its quality, its season, its price. She must understand the storing and keeping of foods; must be master of all the many methods and branches of cooking from boiling a potato to high-class confections, from serving a good wholesome dinner cooked in one pot to an elaborate dinner of many courses made from the best and richest ingredients; must have a knowledge of *menu*-making in all its aspects, and of the quantities to order and cook when catering for

numbers; and, finally, must have knowledge of gas and electric stoves, coal ranges, steam boilers and cookers, and all kitchen plant and utensils.

Learning for Home Efficiency. Those who learn for their own use in life and in order to run their homes in the best possible way, should learn of the above just what is needed for their surroundings and conditions. High-class cookery, confectionery, and sweet-making will not be wanted by the majority of housewives; but a rich woman will command far more respect from her staff when they realize that she has knowledge at her back. Therefore, every girl and woman should learn how to cook and order meals, and the teacher should be able to draw up and carry through a successful course or courses according to the needs of her pupils and their place in the community.

Cooking should, therefore, be taught in every type of school and in all schools. In elementary schools the children should start the subject at the age of 11 or 12; and the remarks made in the article on **HOUSEWIFERY, THE TEACHING OF (q.v.)** apply to the teaching of cookery, namely, the importance of linking up this special subject with the ordinary school subjects, of the one or the two consecutive sessions per week. The teaching should be a foundation for continued instruction, progressive in character, in the continuation schools.

Learning in Order to Teach. The conditions for those who learn cookery in order to teach have changed during the past five or six years. It used to be possible for a woman to train for a teachers' cookery diploma only, and to be a specialist teacher of cookery; but now cookery is included in a domestic subjects diploma, and those wishing to become expert teachers of this branch must take further instruction before attempting high-class cookery and confectionery.

The amount of cookery at the present time included among the subjects for the domestic subjects diploma is only sufficient to qualify the holder to teach in primary schools; that is, if the minimum amount of knowledge is to be taken as sufficient for these schools. Most experts consider that only the fullest possible training is good enough for teaching in any type of school or college.

For the last few years the experimental method of teaching cookery has been tried on a scientific basis, both in the training schools and secondary schools; and, with the guidance of a clever teacher with a knowledge of science, good results have been obtained. But the experimental method, instead of giving more freedom of action on the part of the pupil, may result in great waste of time. Some experts think that it should be the method adopted in the first courses, but far better results are reached if the experimental stage follows a good grounding in fundamental principles.

Training Professional Cooks. For those who learn in order to gain a livelihood other than by teaching, the subject is full of interest. Courses vary in length according to the previous experience of the individual and the work for which she desires to qualify. A *Cordon Bleu* lady-cook takes at least a year to train, and the training is mostly practical, with lectures on buying, storing, food-values, menu-making, etc. The housekeepers' course may be from three to six months or longer. The canteen and national kitchen supervisor and cook's course is from four weeks, since the candidate must have a preliminary knowledge of the rudiments of cookery, and all she should have to master is the large

quantities and a few consequent variations of method.

Book-keeping, buying, store-keeping, equipment, food values and diets are taught by lectures as well as by practice.

Positions as school matron, lady-cook, house-keeper, supervisor of canteens, institutions, and hospitals are to be obtained by those who have taken a good course in practical cookery, with a certain amount of necessary theory; and the practical woman with plenty of initiative and common sense is seldom in need of a post if by training she becomes a good cook and manager. (See also **DOMESTIC SUBJECTS, TEACHER OF.**) E. G. C.

CO-OPERATION OF PARENTS AND TEACHERS.

—At a conference, held in King's College, London, in 1876, a paper was read by a head master stating four conditions with which the parent should comply. He must (1) keep his mind open to the best that is thought in education; (2) select a school carefully; (3) trust largely to the schoolmaster's skill, honesty, and experience; and (4) exercise his influence under the direction of, and in concert with, the educator. It is recorded that the publication of this paper cost the writer a large number of pupils.

As it is a primary condition of success that the pupil shall have full confidence in the school, the parent must feel that he is co-operating with experts. He must recognize that it is his business to supply the teacher with an efficient pupil, able and willing both to learn and to unlearn. The pupil must learn from the example of his parents to obey every rule of the school. Punctuality and regularity are not sufficient; diet, hours, and habits must be so ordered that the pupil shall attend in fit condition for work. Parent and pupil must study the school interests. If all parents reached this ideal standard, inefficient pupils would cease to exist. The fact that these are numerous in all schools shows that parental co-operation is at present largely inefficient. The remedy is to transfer the blame for inefficiency from the teacher, whose responsibility is for the present, to the parent, who is responsible for the past.

C. SIMMONS

CO-OPERATIVE HOLIDAYS' ASSOCIATION.—

(See **NATIONAL HOME READING UNION, THE**; **PATON, JOHN BROWN.**)

CO-OPERATIVE MOVEMENT AND EDUCATION, THE.—

The attitude of "co-operation," or, rather, of the Co-operative Movement, towards education is, and has been, twofold. From the earliest days of this movement, the men and women interested in its development had ideals in education, and made efforts to attain them. There followed, naturally, co-operative opinion and co-operative practice in matters educational. Co-operative opinion in matters educational owes its origin to the teaching of Robert Owen and his most prominent disciple, the late G. I. Holyoake; and found its earliest expression in the statement that ignorance was not the birthright of a people, but that, rather, opportunity to develop in each individual his every faculty was a right that ought to be granted to him. Consequently, when, in 1844 the locked-out flannel weavers of Rochdale, who were the pioneers of co-operation as it is known to-day, issued to the world their famous manifesto they included in it education. Vitally important

as production and distribution were to men in their position, for they had taken up arms against wrong conditions of labour and bad methods of trading, they considered education equally important. Indeed, it appears side by side with both in their statement of intention. They seem to have been sure that in the making of things they were wronged, that in the distribution of food-stuffs they were defrauded; and to have been equally certain that it was their ignorance that made these malpractices possible. Consequently, they made education a first charge on their trading profit; and there are many who assert that this is a chief cause of the rapid growth and great success of co-operative trading.

Early Attempts. The earlier attempts were somewhat hampered by the Industrial and Provident Societies Act of 1856 not including, as a legal provision, the right to find money for education; and societies established between 1856 and 1862, when this provision was again legalized, did not all include education in their objects of association. But so strong was the opinion in its favour, and so general is the sense of its necessity, that co-operative societies, as a rule, devote considerable sums annually to further education; sometimes by a percentage on net profits varying from $\frac{1}{2}$ per cent. to 5 per cent., and sometimes by annual grants. The total sum thus applied amounted, in 1914, to over £110,000.

Modern Developments. The general attitude of the "Store" towards educational effort is that it is the duty of the organization—

(a) to make it possible for members to take advantage of facilities offered by the State or the municipality; and

(b) to provide opportunities of study where these do not exist.

In the furtherance of the former, fees have been wholly or partially paid for students; prizes and scholarships giving access to higher education have been given; grants have been made to bodies, such as the Workers' Educational Association, whose chief aim was to find opportunities of study for industrial workers, or to technical and other institutions having the same end in view. Through these avenues, many young people, children of "Stores" members, have been able to develop their abilities along lines that otherwise would have been impossible; even, in some instances, to reach and graduate in one of the older universities.

Before the State provided elementary education, the Co-operative Movement had organized evening schools and classes. Very early, too, the members provided from their funds reading and discussion rooms, libraries, and lecture halls. A glance at an old catalogue, or list of news and other papers supplied to the reading rooms, shows that their policy was broad and open: they catered for many widely different lines of thought. No purely political or religious discussions or addresses were encouraged, but books and pamphlets for interested thinkers on most subjects were available. After the '70's, attention was mainly devoted to other than elementary subjects. Under the old Science and Art Department, hundreds of classes on various subjects were organized by co-operative education committees. These were mostly technical, having special reference to local industry; but there were others of general civic value. In Sunderland, for example, there were excellent classes in steam, engineering, and naval architecture; in the

county of Durham, surveying and mining engineering classes; and this, in both, without the exclusion of English literature, history, hygiene, and economics. The official reports show that no mean success attended these efforts.

Gradually, as State control included these fields of educational activity, the co-operative committees turned their attention more and more to one phase of education: the training of the citizen. Elementary and technical teaching, and, in most places, the provision of ordinary libraries, are left to the State. The "Store" does not seek to compete; it supplements. Such libraries and reading-rooms as continue to exist are on somewhat specialized lines, either dealing with citizen subjects, or having direct bearing on the work of the existing classes.

Scope of Educational Activities. The years that have passed and the experience gained seem to have given to co-operators not only a definite attitude towards education, but also definite ideas as to its scope and possibilities. They believe firmly in equality of opportunity, and their educational efforts reflect that belief. Their view is that education should form character—social as well as individual; and should fit men and women to take foremost places in industrial and social reform and civic life generally. Their special purpose of later years is well set forth in a programme of educational work annually issued by their Central Educational Committee, a body representative of all portions of the British Isles. In this programme they specialize on the history and principles of their movement, on economics, industrial and constitutional history, and on citizenship. In connection with each, they have definite ideas promulgated in definite courses of study, all clearly set forth in syllabuses. They begin with the members' children, and have issued for them a very readable, simple booklet, entitled *Our Story*, which is mainly an account—admirably written and profusely illustrated—of the transition period in industrial history, wherein was born the co-operative ideal. They arrange junior classes for the study of this little book, and offer prizes and certificates. This work is highly appreciated, as will be noted by the fact that a little over 20,000 children were enrolled in these classes during 1919. As these children become "young people," they are invited to read and think about a series of lives of eminent citizens, a text-book on industrial co-operation, and other works on industrial history and economics. Many very successful classes on these subjects were arranged in 1919, and 2,500 students were being taught by more than a hundred qualified teachers. Quite one half of the enrolled students are women, and a very large proportion are middle-aged. In this connection, too, prizes and certificates are offered. The prizes of late have taken the form of scholarships tenable at a summer school, and granting residence and tuition thereat for a fortnight. Co-operators have themselves provided summer school facilities, and have just completed their seventh session (1919) during which over 700 students attended five centres—one of which was in Ireland.

Distinctive Features. It is perhaps in the syllabuses already referred to that one traces evidence of "views" (e.g. co-operators do not accept the "Marshall" view of economics, nor his teaching in its entirety). From an examination of the syllabus on "Economics of Co-operation," one can

easily deduce that they are putting more stress on collective action than on individual freedom; and they hold that life—healthy, happy, and fitly spent—is the highest possible form of "National Wealth." Their attitude towards industrial history and the problems it presents is very humane and reasonable. They do not regard force as a factor in a practical solution, and discuss trades unionism and its possibilities frankly, freely, and in a truly friendly manner.

The technical work—that of shopkeeping, its record and trading generally—receives careful attention in the scheme of the co-operator. A beginning is made with the apprentice, whose early education is so often evanescent; and he is led on to classes on management, based on text-books prepared by leading managers in the movement. Here, again, the courses of study are carefully graded, and here, again, the response is fairly satisfactory. In 1914, in the Management and Office Classes, there were 2,092 students. Certificates and diplomas as managers, secretaries, or auditors are issued, and a successful system of Examination Boards has been developed. All through, co-operators keep in touch with other educational influences. They sit on University Joint Committees, on Workers' Educational Association Committees, on Education Authorities—sometimes as co-opted and sometimes as elected members—and on the Boards of Managers for day and evening schools. By these links, they are constantly in touch with other lines of action as well as their own, and are thus helped to evolve an opinion and a policy which will have in them all the elements of true onwardness without the drawbacks of petty and parochial littleness. There is evidence of great virility in co-operative education and of much that is helpful in the general attitude towards education adopted by the leaders in the Co-operative Movement.

W. R. R.

CO-OPERATIVE SOCIETIES, SCHOOL.—(See RURAL POPULATION, EDUCATION AND THE.)

CO-OPTED MEMBERS OF EDUCATION COMMITTEES.—(See GOVERNMENT OF SCHOOLS IN OTHER THAN COUNTY AREAS, THE.)

CO-ORDINATION OF MENTAL AND PHYSICAL EDUCATION, THE.—There has been a very marked advance during the last decade towards the co-ordination of physical and mental education. Games and physical exercises are no longer regarded by the majority as means of recreation only, but are gradually becoming important parts of the school curriculum. Remedial drill is also taking its place as a means of curing both mental and physical defects. We are still, however, far from the ideal co-ordination of physical and mental work. Recent research has shown that the relative fatigue values of different subjects vary to a considerable degree: of these, gymnastics and physical drill head the list of fatigue-producing lessons, and can no longer be used as means of relaxation from harder mental work. The close connection—if not the identity of mental and muscular fatigue—has also been demonstrated and, as a result of this, much revision of school time-tables will be necessary.

The value of games for mental training as well as physical development has been established to some extent. The group game is probably the most cogent means of producing harmonious development in

individuals of a certain type. The great national English games appear to have been evolved to fit a need, and they probably owe their great popularity to this fact. A game such as football not only develops co-ordination of muscle, which can be gained in other ways, but it trains the mental qualities of alertness, quickness of decision, judgment, and resourcefulness. Co-operative play, which appeals so strongly to the adolescent, also helps in the development of the power to work as a unit and part of a whole, which is so essential for civic life.

The value of handwork as a means towards brain development has been long recognized, but so far it has only been made use of to its fullest extent in the schools for the mentally deficient.

Researches are proving that brain development is closely correlated with motor activity; and, when this fact is fully established, we may hope for far-reaching changes in our school curricula. Handwork will become one of the most important branches of the general work of every school, and games will be regarded as a fundamental part of the school training and be arranged for accordingly. At present our education is admittedly too bookish, and we fail to get the full benefit of the development which will result from carefully co-ordinated training on the physical and mental side.

M. J. R.

COOTE, EDMUND.—Author of the *English Schoolmaster*; Pensioner of Peterhouse, Cambridge; matriculated in Easter Term, 1576; took his B.A. degree, 1579–1580, and M.A. 1583. Edmund Coote was head master of Bury St. Edmunds Grammar School, 5th June, 1596, to 18th May, 1597. He is of special interest in English educational history as the writer of a text-book, in English, for the use of strictly elementary schools, written when Coote was master of the Bury St. Edmunds Grammar School.

Recognizing the destructive proclivity of children, Coote says: "I have so disposed . . . my first book, that if a child should tear out every leaf so fast as he learneth, yet it shall not be greatly hurtful; for every chapter repeateth and teacheth again what has gone before." Coote's own description of his book is that it enables the schoolmaster to teach all scholars, "of what age soever, the most easy, short, and perfect order of distinct reading and true writing of our English tongue." He claims also that by its use "any unskilful person may easily both understand any hard English words in the Scriptures, sermons, or elsewhere heard or read." The book, therefore, is the first reading-book, the first spelling-book, and the first elementary compendium in any common use in elementary schools in England. It had a considerable circulation, if we may judge by the fact that the forty-second edition was published in 1673. In 1656 its price was a shilling, and it consisted of seventy-nine pages: thirty-two pages were devoted to spelling; about eighteen pages to a religious catechism, prayers, and psalms; five pages to chronology; two to writing copies; and two pages to arithmetic. The volume passed into the publications of the Stationers' Company. The author's preface shows that, about 1600, elementary education was largely in the hands of "men and women of trade as tailors, weavers, shopkeepers, seamstress, and others." Coote claims, addressing the teacher: "With this book in hand 'thou mayst sit on thy shop-board,

at thy looms, or thy needle, and *never hinder thy work*, to hear thy scholars." F. W.

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DONALDSON, J. W. *Address at Tercentenary of Bury School* (pp. 28, 30, 69).
WATSON, FOSTER. *English Grammar Schools* (p. 177).

COPERNICUS (1473–1543).—To Nicolas Copernik—a quiet and studious monk, not possessed, so far as we can judge, of really outstanding intellectual capacity—it was given to effect that great change in men's view of the universe which is called the "Copernican revolution." Born at Thorn, in Polish Prussia, he studied at Cracow; afterwards visiting Bologna and Rome, where he was for a time professor of mathematics. He returned home in 1505; became canon of Frauenberg; and seems to have spent the rest of his life uneventfully, busied with his ecclesiastical duties and his studies. The publication of his great book, *De Revolutionibus Orbium Coelestium*, may be regarded as marking the dawn of modern astronomy. Copernicus compiled more exact tables of the planetary motions, and reached the view with which his name is associated—namely, that the earth is a planet and that the sun and not the earth is the centre of the heavenly system—long before he embodied it in his life-work. For many years he worked out the consequences of this, and barely lived to see his book—the first copy of which was placed in his hands on his deathbed on May 23rd, 1543. His bonds to the past are clear; as when he uses the perfection of the sphere in support of his proposition that the universe is spherical. Similarly he argued that all "simple," or whole, bodies—like the planets—must move in circles. Parts of bodies when separated—like a stone lifted from the surface of the earth—move together in straight lines. By thus supposing that the planets (including the earth) move around the sun in circles Copernicus simplified planetary theory, not by sweeping away epicycles altogether—that was left to Kepler (*q.v.*)—but by substituting simple epicyclic chains for the increasingly complex ones required on the Ptolemaic theory. He explained the seasons; and as the very crown of his achievement he showed that the precession of the equinoxes, discovered by Hipparchus, could be accounted for by supposing the earth's axis to have a conical rotation. Though Copernicus proved his view to be more than a bold speculation he did not answer the mechanical objections to it. It is obvious that the mechanics of Copernicus is inconsistent with his system. Did he see this, and hope for the future developments of mechanics? De Morgan has made this suggestion only to reject it. It seems more probable that the remarkable sentence in the preface written by the first printer of the book, Osiander of Nuremberg, expressed the actual view of Copernicus: "It is not necessary that hypotheses should be true or even probable; it is sufficient that they lead to results of calculation which agree with observation." If so, this is no mere sop to anthropocentric prejudice but is quite consistent with Copernicus's outspoken dedication to the pope: "If there be some babblers who, though ignorant of all mathematics, take upon them to judge of these things . . . because of some passage of Scripture which they have wrested to their own purpose, I regard them not, and will not scruple to hold their judgment in contempt." It

was not, indeed, until the beginning of the next century that the church recognized the danger of the new view and persecuted its adherents. (See also ASTRONOMY, HISTORY OF THE TEACHING OF.)

A. E. H.

COPULA.—(See JUDGMENT.)

COPYING OF MSS., HOW TO TEACH THE.—

Few men are able to draft a composition of importance in its final form at the initial attempt. The problem here is: How shall the teacher give effective guidance to prospective clerical workers to enable them to produce correct transcripts of MSS. which are often scrawls, with alterations, inter-lineations, marginal and foot-notes, and sometimes criss-cross writing? Rule-of-thumb methods of production and revision complicate the problem. Many MSS. have arbitrary abbreviations, and no punctuation except the full-stop.

Some copyists have great variety in MSS.—statistics, dialect, abstruse scientific and technical terms, foreign phrases, etc.; a sound education and wide general reading should, therefore, be put before students as essentials of success. Then, a thorough knowledge is required of current abbreviations, terms, phrases and marks for proof-correcting, a good vocabulary, and sound common sense; and also a rapid style of plain handwriting, accurate spelling and punctuation, and a good display.

Instruction should proceed somewhat as follows: Handwriting following the suggestions of the Civil Service Commissioners should be supplemented by dictation practice to increase the speed to, say, twenty words a minute. Revision of punctuation rules should be thoroughly undertaken, the points being made that there is no absolute standard, and that, unless obviously incorrect, the pointing of the MSS. must be followed. Set lessons on abbreviations, especially the standard Press list and others more or less uniform, should be given. A collection of graduated examples of MSS. should be worked through, speed being subordinated to accuracy and good writing. All exercises should be corrected for verbal accuracy, if necessary, by the students: the teacher reading aloud and afterwards marking. Except when special tests are given, students should be encouraged to use dictionaries.

Points of special importance are the following—

The danger of omitting a passage through a word appearing more than once on a page may be prevented by sliding a flat ruler or piece of paper along the MSS.

Alterations of order may lead to omissions—enclosed passages and carets should be carefully watched. Numbered words sometimes show a changed order.

Most abbreviations should be written in full; and may be used in names of firms, notes, etc.

Special care should be taken by students to check figures (especially additions), and to write tabulations *across*.






Words should often be used for figures—clear instructions should be given.

The Capitals *I, J, T, S*, and the small letters *i, e, l, m, n, t, u* may clash; as may *y* with *g* for *-ing*; the long and short *s* with *p*; and *d* (like *delta*) with *s*.

Bad MSS. should be read through before writing is commenced; careful reference to similar signs

will aid reading but blanks should be left rather than nonsense inserted.

Obvious slips of grammar and spelling should be corrected.

The following printers' marks should be understood:  for delete; *set* in margin and under a word crossed out, to restore it; *trs* and  to transpose order; N.P. and  to show new paragraph start; *run on* and  to show words should continue without break; *caret*  to show something must be inserted there.

V. E. C.

CORDERIUS (better known under his French name, Mathurin Cordier).—Pedagogue and humanist; was born in the Perche (Maine) in 1479, and died at Geneva in 1564. This simple college principal, whose long life was entirely devoted to elementary education, officiated in succession at the Collège de la Marche at Paris, where he had Calvin as a pupil; at the Collège de Navarre, at that time at Nevers; and at the Collège de Guyenne at Bordeaux, whence, on his conversion to the principles of the Reformation, he passed into Switzerland in 1537: there he taught at Geneva, Lausanne, and Neuchâtel, and finally at Calvin's College at Geneva (1557–1564). "Le 8 de septembre mourut le bonhomme Corderius en grand aage, ayant servi jusques à la fin en sa première vocation d'enseigner les enfans et conduire la jeunesse en toute sincérité, simplicité et diligence" (*Register of the Company of Pastors*).

Cordier's life-work was to attack in the name of common sense the twofold abuse which then held the colleges in shackles: the barbarous Latin of the scholastics employed by the masters, and the dog-Latin of their pupils. It is impossible for us to form a conception of the proportions which this absurdity had reached prior to the Renaissance; it would be incredible, had we not before our eyes in the documents of the universities undeniable examples which fully justify the anathemas of Erasmus and Rabelais. Cordier, inspired by the happy example of Mosellanus (*q.v.*), ventured even further. His *De corrupti sermonis emendatione et latine loquendi ratione liber*, published by his friend Robert Estienne in 1531, is in intention an indictment of "barbarism." Later, an edition of it appeared transformed into a class-book under the title of *Commentarius puerorum de quotidiano sermone* (4th ed. 1580, Rob. Estienne), from which the instances of corrupt speech had been removed. It was followed by several other academic writings which recommended themselves by a twofold innovation: on the one hand, Cordier substituted phrases of simple correct Latin for the jargon, amazing specimens of which he has preserved for us, such as "Bonum mane," "Bonus vesper," "Vadamus ad promenandum nos," and "Tu trainas vestem tuam"; and, on the other hand, he nearly always joins to them French translations, a practice almost unknown till then. Thus, he published, in 1536, at Lyons, "L'Interprétation en français des dialogues latins qu'on attribue à Caton"; later, various little works clearly inspired by the Reformation, though acceptable to, and accepted by, the Catholic schools—"Sentences extraictes de la Sainte Escripture pour l'enseignement des enfans" (1551); "Epistres chrestiennes" (1557); and also a very interesting booklet of eighty pages called *Sententiae proverbiales gallico-latinae*

(Paris, 1549), in which certain quotations from the Latin comedies and certain old popular French sayings are ingeniously juxtaposed on opposite pages. But the principal work of Cordier did not appear till the year of his death: *Colloquiorum scholasticorum libri iv ad pueros in latino sermone exercendos* (Geneva 1564). In this we find, under the form of conversations between scholars obliged to speak in Latin, a vivid picture of school-life at Calvin's college in the sixteenth century, with fascinating hints of fun and good-fellowship, and the first intimations of that liberal discipline which was a natural outcome of the Renaissance. These "Colloquies" appeared in very many editions in Switzerland and France, most of them having the Latin text on one side and a French translation on the other side of an opening. Several editions were published in France in the reign of Louis XIV, and they were printed and reprinted at Geneva, to be used as a schoolbook, right down to the end of the eighteenth century. It was this work that especially earned for Cordier the name of the "Lhomond of the sixteenth century." F. E. B.

CORDOVA, THE UNIVERSITY OF.—The main interest attached to the history of the centres of learning among the Mussulman people is that they have always closely adhered to the religious tenets of Islam. Therefore, to have an acquaintance with these centres or universities called Mederschs, involves an accurate knowledge of the whole theological, legal, political, and social system which that religion involves. This, however, is rather difficult to obtain in the actual Mederschs, since they, excepting in Egypt, are inaccessible to non-believers.

Sciences were cultivated in the earliest days of Islamism in Cordova, Bagdad, and other brilliant, prosperous cities. Close to the ordinary mosques there were reading and writing schools; and close to the chief ones, or Aljamas, were superior schools for teaching theology, grammar, literature, and the written and customary law.

The first general mosque-colleges or universities were not to be found in Arabia until 1065, when the University of Bagdad was established. The innovation, however, was not adopted immediately in Spain, and it is curious to record that it was a Christian king, Alphonse X, of Castile, who introduced it afterwards in his college of Murcia, where science was taught to Christians, Jews, and Moors together. In a limited sense only, therefore, can we speak of Arabian universities in Spain when we refer to the superior schools which flourished in the Arabic centres of Cordova, Granada, Seville, Valencia, and Saragossa. These schools had not the normal lines of universities, since they did not form an organized body, but consisted rather of a free concourse of private professors, paid directly by the students, with no regular and uniform plans or rules for directing their studies. However, in spite of there being no other elementary schools than those attached to the mosques, the diffusion of culture was so great that Dozy says that most Spaniards could read and write, while the rest of Europe was far from having reached this stage.

Among the Arabian superior schools in Spain, those of Cordova are the most celebrated. They were in existence at the end of the eighth century, Hixan-el-Radhi, who established others elsewhere in the Peninsula, being their founder. The Cordovan schools attained their greatest splendour in the

tenth century, which is, too, the apogee period of the Arabic-Spanish culture. The reigns of the Caliphs Al-Hakem II and his son, Hixem II, mark the triumph of literature, art, and of science.

Famous Arabic Physicians. The Cordovan schools excelled above all in the teaching of Medicine, at a time when this science was very backward throughout Europe. Even the Christian aristocracy, in spite of their hatred towards everything Moorish, had to come into Cordova to seek remedies for their ills [e.g. King Don Sancho *el Craso* (the Fat) went to Cordova to place himself under Arabian doctors]. Don Sancho was a king of the Christian Kingdom of Leon (North of Spain), and it would have been nearer and easier for him to travel to France, had Medicine been more advanced there.

The names of Averroes, Avenzoar, Aben Mervoon, Albucasis, Rasis, and Avicenna are renowned in the history of Medicine: they covered the whole range of older medical science in the East, which spread over the West during the Middle Ages. Sprengel says that the Moorish physicians of Spain did much research; in Medicine the most important being Aben Mervoon and Avenzoar; and, in Surgery, Albucasis. Albucasis described the operation of "paracentesis"; Averroes studied partial paralysis; Avenzoar specialized on the throat, and conducted experiments in tracheotomy; Rasis and Avicenna accurately described smallpox. These works still formed the subject of lectures in the University of Louvain early in the seventeenth century. The chemistry or alchemy of Avicenna, the Cordovan; the pharmacy of Ben Said; and the large collection of simple remedies of Ebn-el-Bey-thar are still read.

The works of all these Arabian professors, translated into Latin, were used as text-books in the best European schools during the twelfth and thirteenth centuries, mainly in Salerno and afterwards in Salamanca. In the Cordovan schools was educated the chief historian of the Arabs, Ibn Haiyan, at the time when the fame of these celebrated schools was declining, and they were about to fall under the barbarism of the ferocious hordes of Almoravides and Almohades.

Besides these schools, there were, in Cordova, academies where learned and scientific men met to debate. Almanzor, the terrible foe of Christians, set up an academy of Philology, which only men well known already through their scholarly works attended. These academies were numerous in Cordova even at the end of the tenth century (i.e. the time when ignorance was most prevalent throughout Europe). Cordova, the chief political town, retained her literary supremacy. After the crushing of Caliphdom, other towns—Granada, Seville, Saragossa, Valencia, etc.—tried in vain to obtain the supremacy; and the famous Aljama of Cordova continued as the classical centre of Arabic culture in Spain. C. R. G.

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CORK, UNIVERSITY COLLEGE.—Founded in 1849 under the name of Queen's College, University College stands on a beautiful site which the seventh century Gill Abbey once occupied on the river in the west of the city of Cork. The fine buildings are in the Tudor-Gothic style of architecture, and were designed by Sir Thomas Deane. They contain a museum, excellent laboratories, and a large library. With its two sister colleges at Belfast and Galway it originally formed part of the Queen's University. (See IRELAND, THE NATIONAL UNIVERSITY OF.) The faculties were arts, engineering, law, and medicine, but theology was rigidly excluded. By an Act of 1879 Queen's College became the Royal University of Ireland. This was a mere examining body, recognizing English, science, music, law, medicine, and surgery, and students of the Catholic University took its degrees along with students from the three university colleges. In 1908 the college was reconstituted, and became a part of the National University of Ireland.

It grants the degrees of B.A., M.A., and D.Lit. in arts; B.Sc., M.Sc., and D.Sc. in science and commerce; LL.B. and LL.D.; and M.B., M.D., B.Ch., M.Ch., B.A.O., M.A.O., and D.P.H.

Women graduates were admitted from the inauguration of the Royal University, and for a long time it was a custom for women who had been classed in the triposes and honour schools of Oxford and Cambridge to repair the defect of a degree, which was refused them at those ancient seats of learning, by graduating either at London or in Ireland.

CORNELL UNIVERSITY.—(See UNITED STATES, COLLEGES AND UNIVERSITIES OF THE.)

CORPORAL PUNISHMENT.—The use of corporal punishment in schools is evidence of the inadequacy of any known system of rewards or prizes to meet and deal successfully with each and every problem of pupil-personality as it arises. Abnormality is existent. There are pupils with an overwhelming tendency to slackness—moral, mental or physical—and not a few with an apparently fixed determination to travel a self-directed course. In such cases, when all known inducements to effort or obedience have failed and the problem is still urgent for solution, the plain duty of the responsible teacher is to use temporary physical pain as a stimulus or deterrent rather than risk permanent harm. This is no plea for the indiscriminate use of corporal punishment. Corporal punishment is, at best, but evidence of failure on the higher plane of appeal. It is, therefore, always the last resource of the capable teacher, and its indiscriminate or frequent use is an almost convincing testimony to incompetence.

Legal Aspects. Having then accepted corporal punishment as an indispensable though regrettable adjunct of our education system, it is incumbent on the educator to consider the legal position of the teacher who inflicts it, and also the manner and extent of its infliction. The legal position of the teacher in respect of his right to inflict corporal punishment is clear. "It is clear law that the father has the right of administering reasonable personal chastisement to his son, and it is also equally clear law—and certainly sanctioned by very ancient practice—that the father is taken to

delegate to the schoolmaster the same right of corporal punishment that he himself possesses" (Organ's *Education Law*). Punishment by class teachers rests on the same legal basis. "There is no inherent illegality in punishment inflicted by an assistant master, or even by an elder boy, provided the rules of the school permit such punishment" (Organ's *Education Law*).

With regard to the manner and extent of its infliction, it is very essential to remember the following points, each of which is extremely important—

1. The punishment must be moderate and reasonable, having regard to the nature of the offence and also to the age and strength of the delinquent.

2. The punishment must not be administered to gratify rage or passion, and the instrument used must be suitable for the purpose. The nature of the instrument is most important, as it may be, in itself, evidence with regard to the motive prompting the punishment. Hitherto no legal objection has been raised to the use of cane, tawse, or birch.

3. Great care must be exercised as to the part of the body on which the blow falls. Blows on the head should not be given under any circumstances.

4. It must always be remembered that if it can be proved that the punishment was inflicted to gratify passion or rage, or was prolonged beyond the child's power of endurance, it is held to be excessive, violent, and unlawful; and the person inflicting it is answerable to the law for any evil consequences to life or limb.

Attitude of the Public. As regards public opinion, the right of the schoolmaster (*i.e.* the headmasters) to inflict corporal punishment has never been seriously questioned, but much opposition has been offered to the exercise of this right by the class master. Many education authorities have sinned grievously in this respect, but matters are improving, and the most enlightened authorities have long since recognized the inherent rights of the fully-qualified teacher, whether head or assistant. Where this has not been done much harm results. Irregular and even dangerous forms of corporal punishment take the place of regular, harmless, and remedial inflictions, and there is an open temptation to allow lawlessness to go unchecked. If it be granted, as it must be, that corporal punishment is necessary in special cases, the responsibility of withholding from any fully-qualified teacher the right to inflict it is serious, and may result in disaster to both teacher and pupil. W. D. B.

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CORPORAL PUNISHMENT, HISTORICAL ASPECT OF.—

The earliest sketch of a school in Greek literature (a Mime of Herondas, 250 B.C.) portrays an Alexandrian schoolmaster flogging a boy, hoisted on the backs of three others, with a leathern strap, for playing knuckle bones, while his note-book lies neglected, and for saying his repetition at the rate of a word a minute. Roman writers refer to frequent flogging from Horace's *Plagosus Orbilius* to Martial's curses. The only surviving picture of a Roman school, now in the Museum at Naples, represents a boy being hoisted and flogged. Quintilian, in his *Institutes of Rhetoric* (c. A.D. 80), was the first writer on education to disapprove of corporal punishment, in the face of "accepted practice, and

though Chrysippus (the great Alexandrian writer on education, c. 220 B.C.) does not disapprove of it." St. Augustine was flogged at school for slowness, which was "deemed praiseworthy by our fathers." A century later, the Gothic nobles, in the case of the son of the great Theodoric the Goth, disapproved of the flogging which broke boys' spirit. "If they fear the master's strap now, they will never look on sword or javelin without trembling." Alcuin (c. 790) says how "fatherly floggings brought him to man's estate." In the earliest extant English school-book (Aelfric's *Colloquy*, c. 1000), the boys say at the outset that they would rather be flogged than remain ignorant. A number of the stories show how frequent and fierce were the floggings, from which saintly protection was sought.

Flogging in Mediaeval Times. It was a matter of discussion in canon law treatises whether, if a son taught his father, the right of chastisement which, by the law of nature, the father possessed over the son, did not yield to the canon law right of chastisement which the son as teacher possessed over his pupil. It was the special insistence by her uncle on the whipping of Helcise by her tutor Abélard if she did not do her lessons properly, which gave occasion to their tragic love-story. At Chartres Cathedral (c. 1141) Grammar is represented with birch drawn and erect ready for use in her right hand. In a fifteenth-century misericord at Sherborne Abbey and Norwich Cathedral, pictured in the same books, the Grammar Schoolmasters are dignified by representations of their bringing down mighty birches on the bare backs of their pupils. In many of the schools re-founded and re-incorporated by Edward VI, or Queen Elizabeth, the corporate seal shows the schoolmaster seated with birch drawn and erect, as at Macclesfield and Louth (1552), Rivington (1586), or a rod as at Blackburn (1567). There is a famous picture in "School" at Winchester, begun in 1683, with the motto "Aut disce, aut discede, manet sors tertia caedi" (learn, leave, or the third lot is to be licked). It is almost certain that this picture is a reproduction on a larger scale of a somewhat similar picture in the original school. The canon law, as stated in the *Cursor Mundi*, authorized floggings only in moderation. Thomas Tusser received at Eton "full fifty-three stripes given to me for fault so small or none at all." Ascham mentions the famous discussion on flogging at Eton, from which boys ran away. Richard Mulcaster (*q.v.*) was in advance of his age, but advocated that the rod be kept in sight. Comenius in the first, and Locke in the last, part of the seventeenth century protested against the folly of inculcating learning by flogging.

The Nineteenth Century. Even the nineteenth century saw such mighty floggers as Wooll of Rugby (1806-1828), a small man, who flogged the whole of a form of thirty boys at one sitting; and Keate, of Eton (1809-1834), who was said to have whipped forty boys who came to him for a confirmation class, assuming that they must have come for the sacrament of penance. Yet the great public schools were homes of mildness compared with many of the smaller ones. The chief reason was that in the great schools only the head and the second masters could flog. A. F. L.

CORPORATION OF THE SONS OF THE CLERGY.—This institution was founded in 1655, and incorporated in 1678, for the purpose of relieving

necessitous clergymen, pensioning their widows, and educating, apprenticing, and providing for their children. The Festival of the Sons of the Clergy, held annually in May at St. Paul's Cathedral, commenced in 1655, and was virtually the foundation of this Corporation. The proceeds of the festival are placed at the disposal of the Corporation, and the stewards become governors. The Lord Mayor and the Archbishop of Canterbury always attend the festival, and frequently a member of the Royal Family. Children of 14 years of age are assisted at a school where the fees are such as to warrant the governors in making the grant. The grant is £5 or £10 a year whilst the child is at school, and grants of £10 or £15 are also made towards a course at a university or other institution. Grants of £10 are made towards providing outfit or a start in life, and apprentice grants of £45 spread over a three years' course.

CORRECTION OF ERRORS.—To prevent slipshod work, errors must be noted and corrected, but the teacher must guard against becoming so over-weighted by his task that he loses his freshness and elasticity, and is unable to make a proper preparation for his succeeding lessons.

The commission of errors may be to some extent prevented by a careful preparation of the pupils' minds before new matter is presented to them, and by setting only such exercises as their standard of attainment may warrant. If, in spite of this preparation, an unexpected number of errors is produced, the teacher should realize that either his preparation or his teaching has been at fault, and he should give the lesson again in the light of this experience. An exercise full of mistakes is valueless as training, since the pupil will be bewildered by the number of explanations necessary.

In oral teaching, errors are readily corrected as the lesson proceeds; obvious mistakes may often be corrected by fellow-pupils, those due to general ignorance by the teacher. Small infrequent slips may be ignored; carelessness demands immediate attention. Mere ignorance should be treated with sympathy, and a teacher should never exercise his gift for sarcasm at the expense of his pupil, who cannot reply. A good effort, correct or not, demands praise. This will act as a stimulus, both to the pupil concerned and to the whole class.

Written work should also be carefully corrected. With large classes a way must be found of correcting these exercises whilst the matter is fresh in the pupil's mind. The pupil must be made to keep to the point of the question and to avoid discursiveness. Some forms of work may be corrected by the pupil himself under the teacher's guidance, but generally the teacher must go carefully through the exercise himself.

To be really effective, corrections should be made in the pupil's presence, and his attention called not only to the mistake itself, but to the reason for it, if any can be found, so that the cause may be thoroughly explored. The pupil should be convinced of his mistake, shown why it is wrong, and generally made to re-write that part of his answer. It is well to focus attention upon one error at once, and thoroughly to discuss this before passing on to another. If the exercise is full of mistakes, which are not merely proofs of carelessness, it is one which should not have been set. Obviously careless work should be summarily rejected.

Marking differs in amount and kind in primary

and secondary schools. Naturally, it is much heavier in amount in secondary schools than in primary, and it has become customary in the former to allow time for marking during school hours, and also for much of the marking to be done outside school hours. In this respect, as a rule, women spend more time than men, either from a higher degree of conscientiousness, or from lack of the habit of attending only to essentials. J. W. I.

CORRELATION.—The term "correlation" has two quite distinct meanings in pedagogical psychology. It is, in the first place, a statistical term. The correlation formula of Bravais and Karl Pearson—

$$r = \frac{S(d_1 \times d_2)}{n \times \sigma_1 \times \sigma_2}$$

simplified by Spearman to—

$$\rho = 1 - \frac{6S(d^2)}{n(n^2 - 1)}$$

is a means by which the relationship or "correlation" between two qualities possessed by a number of individuals, for example, between the stature and the mental ability of human beings, may be calculated. Maximim positive correlation works out to +1; maximum negative (or inverse) correlation to -1; absence of all correlation to 0. In the case of most qualities that concern the educator, correlation is positive, but not usually very high. Thus, the correlation between arithmetical accuracy and arithmetical speed might, in a given class of boys, be represented by less than .5, this number indicating that the more accurate boys tended on the average to work more quickly than the slow boys, but that there were numerous exceptions. If the number were very high (e.g. .96), it would indicate an almost perfect parallelism between the two qualities; if very low (e.g. .06), that very little relationship existed between them. The statistical theory of correlation is expounded "popularly" in the writer's *Educational Administration and Criticism* (Chap. XV).

Correlation of Subjects. The other sense of the word "correlation" is connected with a cardinal principle of the Herbartian and Fröebelian movements. The separation of one school subject from another (e.g. Arithmetic from Geography, Geography from History, History from Handicraft, etc.) was perceived by those two great educationists and their followers to be accompanied by many disadvantages. For example, an important source of interest was left unused; it is always interesting to find ideas in one department of human activity throwing light upon ideas in another. Again, the division of school work into "subjects," each forcibly separated from the rest by time-table prescriptions, tended to divorce school work from life. Thus history meant book-history, not current events, or Bible history, or history of the tools used in the handicraft lesson; composition meant writing essays, not conversing naturally and correctly on a theme. Thirdly, a divorce (which still runs through school work) was established between instruction and training, ideas and habits, theory and practice; so some "subjects" become too theoretical and others not theoretical enough.

No educationist is a safe guide who does not realize how deep-rooted is this tendency of the human mind to work in compartments. One of the

chief problems of education is thus, while training the mind to certain "efficiencies" each distinct from the other, to preserve the mind from slavery to this "compartment"-working tendency. The pupil has to become a specialist without ceasing to be human. He has to preserve a naïve, child-like outlook, so that he will not neglect charming and correct speech in ordinary life while heading his class in grammar. The task for education, as thus conceived, is to fight against a deeply-rooted human instinct; but the task should not be made the heavier by attaching sacrosanctity to "subjects" and "time tables."

In reaction from this idolatry of "subjects," there are contemporary educationists who, if the implications of their doctrines are to be accepted, would reduce school work to sheer chaos. (See *LAISSEZ-FAIRE IN EDUCATION*.) The real solution appears to lie along the lines of a series of school occupation-units, each involving theory and practice, ideas and habits; and, taken collectively, introducing the pupil to all the larger phases of human life. The early Fröebelian and Herbartian workers were moving towards this standpoint in their proposals for "correlation" and "concentration"; and some of their attempts, while suggestive, overshot the mark. (See *CONCENTRATION*.)

Possibilities of the Principle. The correlation principle itself is sound, and stands for nothing more than the linking together of such facts and processes as have a bearing on each other. Thus, if certain geographical facts explain certain historical facts, the history teacher should temporarily become a geography teacher, and so on. The correlation principle is a mere return to common sense and a protest against pedantic and unnatural distinctions and separations. It has, however, its own limitations. Owing to the fact that everything in the world is connected with everything else, directly or indirectly, a teacher who is devoted to "correlation" may easily become dangerously discursive. Much ridicule has been poured upon the principle because of the artificial or unimportant links which some teachers have discovered and employed. Like every other principle, that of correlation has to be applied with common sense, otherwise—itself a protest against pedantry—it becomes the pretext of a new kind of pedantry as pernicious as the old.

F. H. H.

CORRESPONDENCE SCHOOLS AND COLLEGES.

—Economy of time and effort and expenditure is the root principle of class instruction. The teacher will reach many minds at once; the learner will have the advantage of all that comes from a common emulation and sympathy of numbers.

But in manifold ways of limitation, the earnest learner is hindered by lack of opportunity. Books must be his teachers, and stand for his university or place of higher education. And where he has a specific aim or particular diploma of success or attainment in view, he will, as a rule, soon find difficulty and require guidance. The expert steps in to help, and writes what he cannot speak. He reduces to type and print what he is unable to teach orally for want of a class present, and thus—with necessary and considerable and obvious qualifications—secures the economical advantages of class instruction. Here, then, we have correspondence schools and colleges of sorts, with different outlook and objective in each case; but all directed towards an academic or professional goal to be approached

by way of examination. It may be said that they have the defects of their qualities; the training they give is not so much educational as precisely practical and pointedly vocational. But it must be urged that the best of them are not only prosperous, but educationally successful: sound in method, with a systematic direction of reading and correction of exercises, they supply the demand of the student who cannot go to school.

A. E. L.

COSMO DEI MEDICI.—(See *RENAISSANCE, THE*.)

COSTA RICA, EDUCATION IN.—The Republic of Costa Rica was declared in 1821, and secured absolute independence in 1848. Its present constitution was established in 1871, and after a series of dictatorships was resumed in 1882. The population is chiefly of Spanish origin, and the prevailing religion is Roman Catholic. The aborigines number only about 4,000 out of a total of 360,000. Education is controlled by the Ministry of Foreign Affairs, under a secretary, a council, and an inspector-general. The provinces are divided into districts, each of which has a school board to provide for the financial needs of the schools. The governor of the province carries out the school laws, and the primary schools are under the superintendence of the divisional government inspectors. Elementary education is free and compulsory for children from 6 to 14 years of age, the Government pays the salaries of teachers and also assists the school boards. There are about 40,000 pupils in the primary schools. Provision is also made for a normal school for teachers, and for schools of arts and crafts, and schools of instruction for women in domestic subjects. Funds for the maintenance of primary schools have, since 1909, been provided by taxes on alcohol and intoxicating liquor. Secondary education, under the Minister of Education, is provided in a number of colleges and lyceums supported in some cases entirely out of national funds, in others equally out of national and municipal funds. Normal training is given in the Lyceum of Costa Rica for boys, and in the Superior College for girls. The secondary schools arrange two courses: one of three years in languages, science, and art; and a more advanced course of two years in higher branches of language and science.

COTGRAVE, RANDLE (died 1634).—He was born in Cheshire, and educated at St. John's College, Cambridge, about 1587. He became secretary to William Cecil, Lord Burghley, to whom he dedicated his French-English dictionary, saying that to his patron he owed "all that he is or has been for many years." The dictionary was first published in 1611, and at least four other editions followed during the next seventy years. It was an unusually careful and intelligent piece of work, and is still frequently referred to as authoritative by students of English and of French philology. A copy of the first edition was presented by Cotgrave to Prince Henry, son of James I. The second edition was prepared for the press by the author himself in 1632.

COTTONIAN LIBRARY.—(See *LIBRARIES IN THE SEVENTEENTH CENTURY*.)

COUNTERPOINT.—(See *MUSICAL EDUCATION, THE AIMS AND LIMITS OF*.)

COUNTRY DANCES.—(See *DANCES, SWORD, MORRIS AND COUNTRY*.)

COUNTRY SCHOOLS, TRAINING OF TEACHERS

FOR.—Despite the fact that many teachers come from the country, and many settle permanently in country schools, there always seems in their minds the belief that they may gain appointments in more populous places. From the point of view of the solidarity of the teaching profession, this attitude is defensible; and, while work in training colleges may, and should, deal with subjects which are applicable to country schools, it is probable that development will move along the lines of the general training of all teachers.

Rural Education. The report of the Rural Education Conference on the qualifications of teachers of rural subjects, issued by the Board of Agriculture and Fisheries, and the Board of Education, in 1911, gives most of the information that is available. It urges—

“The curriculum in rural schools should be less literary than it is at present; and, with this object in view, it should be based upon the employment of manual processes as a method of education, though it should not be forgotten that the aim of practical instruction in elementary schools should always be the general development of the faculties rather than specialized technical training. The teacher should be able to make all the school subjects real to the child by correlating them with such objects as it is familiar with outside the school, thus keeping it in touch with its environment and with what life means to it.

“Remembering that in most country districts the children who have to be taught are rarely more than 13 years of age, and that the intelligence and natural aptitudes of children of that age can be developed most effectively by observation, nature study, and manual work, what is needed in their teachers is a broad general education allied with a familiarity and sympathy with country pursuits; a first-hand knowledge of plant, animal, and insect life; an acquaintance with the sciences underlying rural industries sufficient to illustrate lessons with facts or experiments; and a skill in the use of their hands that would enable them readily to teach such subjects as gardening, woodwork, and other forms of manual instruction. It is a matter of considerable importance that this instruction should not only be part of the curriculum of the school, but should be given by regular members of the staff rather than by peripatetic teachers, so that the children may realize that it is not a special subject but a very important part of their ordinary teaching.”

Eleven years before, the Agricultural Education Committee had passed the following resolutions—

“(a) That this Committee urges upon the Board of Education the importance of so modifying the curriculum of training colleges as to enable theoretical and practical instruction in subjects bearing on rural life to be given at them. The Committee would point out that many of the training colleges are already provided with large gardens which might well be used for the purposes of demonstration and experiment.

“(b) The Committee also considers that third-year students at various training colleges should be encouraged, if they desire it, to pass their third year at some agricultural institution; and suggests that the Board of Education should communicate with the principals of one or two agricultural colleges with a view to an experiment of this nature.”

The Departmental Committee of the Board of Education, appointed in 1901, was instructed to draw up two-year courses for students in training colleges and to consider the above resolutions. It reported—

“Whatever facilities are afforded for specialization, there will be great difficulties in training teachers for the special work of country schools. Nearly all our witnesses were agreed as to the reluctance of students in training colleges to entertain the idea of being classed as country teachers. Many of them may ultimately take rural schools, but even these prefer, when young, to join the staff of a town school, with its prospects of higher salaries and greater social and intellectual opportunities. There will, however, always be some whom early associations, or natural tastes, or considerations of family or health, will attract to the country; and for these it may be hoped that some of our provincial training colleges will, under a freer system, such as is now contemplated, provide a suitable course of instruction.

“The curriculum of the training colleges is, as a rule, too crowded to allow of rural science being taken in the two-year course; though there are instances in which provision has been made for instruction in such subjects, either by sending selected students for a few weeks to an agricultural college, or by lectures given by outside organizations.

“The failure of students to take a third year's course at Swanley or Wye is mainly due to the reason that, directly they have been through the ordinary two-year course at a training college, they are anxious to earn their living; and, after they have begun to earn their living, they are naturally disinclined to take another year's course of instruction at a college where, not only will they be earning nothing, but even their expenses will not be wholly paid.”

Changes in the College Syllabus. The committee advised the inclusion of rural subjects in the training college syllabus, and also manual instruction, and general elementary science, including Nature study. They further recommended that selected teachers should attend certain agricultural colleges if proper financial arrangements could be made.

This report led to the inclusion in the training college syllabus of manual instruction and rural science, and arrangements were made with the Wye Agricultural College and the Swanley Horticultural College with a view to a special third-year course. The result, however, has not been fruitful: few training colleges attempted the syllabus, and those that did tend to drop it. Something has been done by local education authorities by means of evening, Saturday, or vacation classes for teachers actually at work in the areas. The hope for the future seems to be better preparation in secondary schools, so that pupil teachers and bursars may enter training colleges with some knowledge of rural subjects. At present, despite the grant from the Board of Education, the cost is too great to the individual to make the offer practicable.

The work is being carried on in the Cheshire County Training College, where—

1. The Board of Education syllabus in gardening is adopted for a two-year course, and the Board's examination taken.

2. The students take a special course in woodwork applied to rural conditions, in accordance with the Board's recent circular on handwork.

3. Students practise in the College Rural Demonstration School at Haslington and teach gardening in the school.

4. Visits are paid to the rural schools and school gardens.

The College has a science laboratory specially fitted for biological work, and gardens of about half an acre. Each student cultivates one rod as a minimum, besides doing other work in greenhouses, and fruit and experimental plots. There are an orchard, shrubberies, flower-beds of perennials and roses, and greenhouses, both heated and unheated.

The North Wales County Training College at Bangor has also specialized in these subjects. The College follows the Gardening course of the Regulations for the Training of Teachers and the course in Rural Science. The work, however, matures slowly, and this will be so until the payments for country schools are made more attractive. If the teachers of Britain were better organized so that it was clear that men and women who offered their services for rural work were suitably paid, and, above all, if it were known that teachers in country schools would not be forgotten, but, at suitable times, would be promoted to the large town schools carrying with them higher emoluments, there should be no reason why young teachers leaving training colleges should not take up some years of service in the country; and many would, from liking and associations, elect to remain in rural schools. But, so long as the idea prevails that the best of the young teachers will obtain appointments in town schools, it will be useless to expect a great improvement in the training of teachers for rural schools. It would be a great gain if a number of the most successful students could be tempted to spend a few years in country schools.

The Principal of the Bangor College writes—

"Whether work of this kind is undertaken in England or in Wales, there is common disappointment in store. The students do not in large numbers go to the rural schools at the end of their training. The salaries offered by the large urban authorities, and by the wealthier industrial counties like Glamorganshire and Monmouthshire, are too attractive. As a member of the Carnarvonshire Education Committee, I feel that the towns and the industrial areas will always get the best of it as far as teaching power is concerned, no matter what we may do in the way of providing special training for country teachers. Something must be done to equalize salaries before the country child will come by his own in this respect."

The Prospects of Rural Education. The conclusions may be summarized—

1. Students in training colleges do not desire special training for country schools.

2. Experimental science, including Nature study and rural subjects, should take a more prominent place in secondary schools and training colleges. It is the well-trained scientific mind that is lacking.

3. The salaries for rural schools should be improved, so that some of the best of the students may be tempted to undertake rural work.

4. Following on No. 3 is the necessity for so organizing the teaching profession that those who go to country schools should not be forgotten, but should, in a few years, be able to secure promotion to town schools if they so desire. If the services of some of the most capable and most enthusiastic of our young teachers could be secured for a few years in rural schools, there would be a

marked improvement in efficiency, brightness, and development.

The passing of the Elementary Teachers (Superannuation) Act, 1918, and the increases in salary have improved the position of rural teachers, as the increases have been most marked in the salaries of heads of small schools. Teachers with the vocation will be able to follow their inclinations without being penalized in their monetary position. It is, therefore, probable that there will be a tendency for more young teachers to elect to prepare for work in country schools. M. R. W.

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COUNTY AREAS, SCHOOL GOVERNMENT IN.

—The Education Act of 1902 effected a revolution in the local control of elementary education, and a substantial development of the possibilities of local aid and direction as regards all forms of higher education. It transferred to the county councils of administrative counties all the powers and duties concerning the supply and maintenance of public elementary schools and the enforcement of school attendance that had previously been exercised by numerous school boards acting for limited areas, and also the duties as to the enforcement of school attendance that had previously been carried out in non-school board areas by school attendance committees appointed by the boards of guardians. These transfers were, however, subject to the limitation that boroughs with a population of over 10,000, and urban districts with a population of over 20,000, according to the Census of 1901, were to remain independent authorities for the purpose of elementary education alone. (They are generally known as "Part III Authorities," because elementary education is dealt with mainly in Part III of the Act.)

The other principal change made by this Act, so far as elementary education was concerned, was that the voluntary (usually denominational) schools were for the first time made a compulsory charge on the local rates, it being made the duty of each county council, under Section 7 of the Act, to "maintain and keep efficient" all public elementary schools in its area that are necessary. Whether a school is necessary or not is determined by the Board of Education, under the powers conferred on it by the Education Act of 1870, subject to the proviso that a school for the time being recognized as a public elementary school is not to be regarded as unnecessary if the average attendance of duly registered scholars is not less than thirty.

It has since been decided by the courts of law that this duty to maintain and keep efficient applies to each school as carried on at the time when the Act was passed (*Attorney-General v. West Riding County Council*, 23 T.L.R. 171 [1907]), and includes payment of the salaries of teachers in respect of the time during which they are giving religious instruction.

The Act also charges each county council with the duty of taking such steps as seem to the council desirable (after consultation with the Board of Education) to provide, or aid in the provision of, various forms of higher education, including secondary schools and technical institutes, and to promote the general co-ordination of all forms of education. This part of the Act of 1902 took the place of the Technical Instruction Act of 1889, and

conferred on the councils powers and duties much wider than were given by that Act. It also made obligatory, instead of optional, the application for purposes of higher education of the substantial sums of money received by the councils under the Local Taxation (Customs and Excise) Act of 1890, and gave local authorities for the first time the power of giving aid out of the rates to various forms of higher education which do not come within the definition of "technical instruction."

A later Act, the Elementary Education (Administrative Provisions) Act [1907], places on county councils the duty of arranging for the systematic medical inspection of children attending public elementary schools, and gives them the power to arrange for the medical treatment of such children as are found by the inspection to require it. Under the Act of 1918 this power becomes a duty.

From the administrative point of view, the great merit of the Act of 1902 is that it enables a comprehensive view to be taken of the educational needs of the whole population of a fairly large area, and provides an authority with the power to co-ordinate all forms of education and the existing agencies ancillary thereto, and to make good at the public expense any shortcomings in the provisions in particular parts of the area. The Education Act of 1918 is an extension of and complement to the Act of 1902, and makes it the duty of the County Council to consider thoroughly the education of the County as a whole, and to submit a scheme of education for the area to the Board of Education for approval. Before this scheme is finally settled it must be published, and the Council must consider any representations concerning it that may be made by anyone interested therein. When such a scheme has been approved by the Board it becomes the duty of the County Council to carry it out. Amongst other things, the Act requires that County Councils shall make provision by means of central schools, special classes or otherwise, for the better instruction of the older scholars in the elementary schools and in the inclusion of suitable practical subjects (e.g. handicrafts and domestic arts) in the curriculum. To this end the Act gives to County Councils considerable powers (subject to the approval of the Board of Education) of grouping of schools of the same denomination under one body of managers and of arranging for the redistribution of the children therein. Such powers were not given by the Act of 1902, but are essential to any scheme for improving the instruction of the older scholars in elementary schools in county areas.

The C.C. Education Committee. A county council must appoint an education committee, in accordance with a definite scheme made by the council and approved by the Board of Education under Section 17 of the Act. The scheme must provide for the appointment to the committee (1) of a majority of members by the council; (2) of persons of experience in education and persons acquainted with the needs of the various kinds of schools in the area; and (3) of women as well as men. All matters relating to education, except the raising of a rate or the borrowing of money, stand referred to the education committee; and, before taking any action concerning them, the council, except in case of urgency, must receive and consider the report of the education committee on each such matter. The

council may, under such conditions as they deem advisable, confer executive powers on the education committee as regards all or any of the matters dealt with under the Act (except the raising of a rate or the borrowing of money).

A county council may appoint more than one education committee, for controlling different parts of its area or for dealing with different subjects; but this power is rarely acted on. (Somerset and Wilts have separate committees dealing with general education and agricultural education respectively.) Two or more councils, also, may frame a scheme for a joint committee; but, up to the present, very little use has been made of this provision of the Act.

The extent to which councils have taken advantage of their power to appoint as members of the education committee persons who are not members of the council varies widely in different areas; in some counties the proportion of outside members is considerable, whilst in others they are restricted to one or two women, whose appointment is obligatory under the Act. The differences are mainly due to political attitude, and especially to the feeling that affairs of the community should be controlled only by those directly elected by the ratepayers, but the power of co-optation has enabled many councils to secure the services on the education committee of specially qualified men and women who would not have been available if membership had been restricted to members of the council.

Similarly, the degree to which the county councils have delegated their powers to their education committees varies widely. In some counties, the delegation is as complete as the Act allows; in others it is rather limited. Experience shows that some delegation is unavoidable in any but a very small county, if the education work is to proceed at all smoothly and efficiently, since the meetings of county councils are held at somewhat wide intervals, and there are numerous educational matters on which an early decision is indispensable.

Sub-committees. The Education Committee, in its turn, usually transacts much of its detailed work by means of sub-committees. Here again, the number of sub-committees, the functions allotted to them, and the extent to which they are given executive powers, depend on the circumstances of the county. The number obviously depends on the volume of business to be transacted; the extent to which they are made executive is determined by the facilities of communication within the area and, consequently, the frequency with which meetings of the principal committee can be held without undue inconvenience to its members. A typical set of sub-committees in a comparatively small area is: (1) Finance and general purposes; (2) higher education; (3) elementary education. In larger counties the work is further subdivided on such lines as (1) Finance; (2) secondary schools and scholarships; (3) technical schools and classes; (4) school management; (5) buildings and works; (6) health and attendance. All these divisions are more or less arbitrary, and made for convenience; matters frequently arise which require joint action on the part of some of the sub-committees.

Office. The administrative work is carried out by a central office staff, the size and composition of which depend on the size of the county, the extent to which the council exercises its powers in respect of secondary and technical education, and the

degree to which local arrangements and supervision of schools and classes are left to local committees. With scarcely any exception, there is a chief education officer, known as the Director of Education in some counties and as the County Education Secretary in others. Many of these officers have themselves had experience as teachers in some branch of education; others have had a legal training. The larger counties have one or more assistant-directors or assistant-secretaries. The clerks are usually classified in grades, such as senior, intermediate, and junior, or first class, second class, third class, with definite scales of salaries. The general distribution of the work inside the office naturally follows the division between the various sub-committees. Frequently a higher-division clerk is specifically attached to one or more of the sub-committees.

Finance. Counties differ also in their practice as regards the financial part of their education work. In some cases it is done entirely by a finance department of the education office; in others it is done by the finance department of the council; in others, the work is done in the education office up to the point when all claims and accounts have been examined and passed for payment, the actual cheques being issued by the county treasurer or county accountant on the order of the education committee or of the chief education officer, and the book-keeping being done in the county finance department.

Inspection of Schools and Classes. In addition to the administrative staff, several education committees find it advisable to employ one or more inspectors to visit and report on the work of various types of schools and classes. Such inspectors are almost always men who have had teaching experience of one type or another. To a certain extent, they cover the same ground as the inspectors of the Board of Education; but they inquire into various administrative and other points which concern the local authority rather than the Board, and the educational side of their inspection is done from a point of view not necessarily identical with that of the Board of Education. Experience proves that, when, as is almost always the case in county areas, the inspectors of the Board and those of the local authority co-operate with one another, the work in the area benefits substantially as regards both efficiency and economy. Apart from any question of inspection as such, there are distinct advantages in managers and teachers being kept in personal touch, as it were, with the central office by occasional, but not too infrequent, visits of some official representative of the education committee.

School Managers. The methods adopted for the local management of schools and classes differ, not only in different areas, but also according to the type of education dealt with. In the case of public elementary schools, there are statutory requirements as to the appointment of bodies of managers and the ways in which such appointments are to be made; in the case of higher education, the Board of Education requires the formation of local committees for the supervision of schools and classes aided by grants from the Board, but the constitution of these committees is left to the local education authority, unless the particular institution is an educational trust governed by a scheme approved and defined by legislative enactment, in which case the constitution and appointment of the managing body is laid down in the scheme.

Many county committees prefer to deal directly with local committees for each school or group of schools; but some of the larger and more populous counties have established intermediate committees, generally known as District Committees, which exercise general supervision of the educational provision over a moderately wide area, with a view to better co-ordination and the prevention of overlapping. Such committees usually have their own district clerk and may have some executive powers.

Elementary Education. The Act of 1902 provides that for every public elementary school, or group of such schools, there must be a body of managers appointed in accordance with the provisions of the Act. The normal number of managers is six.

In the case of council schools, two-thirds are appointed by the county council or the county education committee, and one-third by the minor local authority (town council, urban district council, parish council, or parish meeting), but the county council can, if it thinks fit, increase the number of managers by three or any multiple of three.

Council Schools, called "provided schools" in the Act, are schools that are completely controlled by the council, and for the entire maintenance of which, including the buildings, the council is responsible. The premises are either the property of the council or may be held by them on lease. Council school managers have only such powers as the county council thinks fit to delegate to them, and the council not only fixes the number of managers for each school, subject to the limitations explained above, but also decides how far schools shall be grouped under one managing body. The degree of delegation of powers to these managers varies widely in different areas. Some county councils leave very little power in their hands; others, on the contrary, give them a voice in the selection of teachers and the general character of the school curricula, and also entrust them with duties concerning the upkeep of the school premises. It is difficult to secure the services of capable and suitable persons as school managers unless the work they have to do is of real importance.

Voluntary Schools, which are described in the Act as "non-provided schools," are on a different footing. They are schools provided under a trust deed or otherwise by some body or person other than the county council, and usually for the purpose of providing some particular form of religious instruction. The normal number of managers is six, but this number may be increased by any multiple of six if the county council thinks it advisable. The grouping of such schools under one managing body can be carried out only by agreement between the council and the managers concerned. The six managers comprise four *foundation managers* and two *representative managers*, one of the latter being appointed by the county council and the other by the minor local authority. When the total number is greater than six, the appointments must still be in the same proportions. The foundation managers are appointed (1) under the trust deed of the school; or (2) under a "final order" issued by the Board of Education under Section 11 of the Act; or (3) where the building belongs to a private owner, in accordance with the lease or agreement of tenancy, which specifies the persons who are to be foundation

managers, and also, as a rule, provides for the appointment of their successors. The representative managers are appointed annually or triennially as the appointing body may determine; the appointments of foundation managers are usually triennial, unless the office is held *ex-officio* or controlled by a lease.

When once the managing body of a voluntary school has been constituted, all the managers have, as managers, precisely the same powers and duties, whichever category they belong to. When the foundation managers are also owners, trustees, or lessees of the buildings, they may have additional powers and duties relating to the buildings; but these arise out of their position as owners, trustees, or lessees, and not out of their office as foundation managers.

The managers of voluntary schools have certain specific duties and powers defined by statute. They are responsible for keeping the school premises in good repair, and must carry out at their own expense any alterations or improvements required by the Board of Education or the county council, though if they consider that the latter body is unreasonable, the question may be referred to the Board of Education for settlement. Neither the council nor the Board has power to require the managers, against their will, to extend the premises so as to increase the number of children for whom accommodation is provided. The managers must place the premises at the disposal of the county council for use as a public elementary school without making any charge for rent; except that, where a dwelling-house for a teacher forms part of the premises, the managers may charge rent for it, should the council desire to make use of it, as it has the right to do. If the county council has no other premises in the parish suitable for holding evening continuation schools or other higher education classes, the managers of a voluntary school must place the premises at the disposal of the council for the purpose of such classes on three occasions during each week.

A county council is not responsible for, and may not incur, any expenditure on the premises of a voluntary school, except in so far as may be necessary to make good such damage as, in the opinion of the council, is due to fair wear and tear arising out of the use of the rooms in the school building for the purpose of the public elementary school. Under this head the council is not liable for any damages to the school offices or playground.

The managers have the power of appointing teachers, subject to the consent of the county council, which may not be withheld except on educational grounds; they also have power to dismiss teachers, subject to the same consent. The managers may give notice of dismissal before obtaining the consent of the council; but, if this consent is not obtained, and the managers persist in the dismissal, the council ceases to be liable to maintain the school. They have the entire control of the religious instruction; and, if the dismissal of a teacher is *bona fide* on grounds connected with the giving of religious instruction, the consent of the county council is not necessary.

The council has control over the expenditure on a school (other than the expenditure on buildings), fixes the number and qualifications of the staff, and controls the secular instruction subject to the provisions of the Day School Code in force for the time

being. Moreover, the council may make such demands of the managers under these heads as they think fit; they may require the dismissal of a teacher on educational grounds; and, subject to appeal to the Board of Education, if the managers do not carry out the requirements of the council, the council may take steps to carry them out as if they were themselves the managers.

School Supplies are almost always dealt with by means of contracts made by the county council. The requisitions from each school are examined in detail in the county office; the council may refuse to supply anything they consider unnecessary for the efficiency of the school or unreasonable in quantity. Many counties adopt the plan of allowing for school supplies not more than a fixed sum per annum based on the average attendance at the school; usually this allowance is somewhat less in the case of infant classes or departments than for the rest of the school.

School cleaners or caretakers in council schools are appointed by the council; but in voluntary schools they are appointed by the managers, at wages fixed by the council. The council is responsible for the payment for such fuel, water, gas, or electricity as is necessary for the day school purposes; but, in voluntary schools, the heating appliances and the fittings for bringing in the water, gas, or electricity must be provided by the managers. Where lamps are used in voluntary schools, they must be provided by the managers, but the council pays for the oil and wicks.

School Attendance. A county council has power, subject to the approval of the Board of Education, to make by-laws regulating compulsory attendance, by defining, within the statutory limits, the age at which compulsory attendance shall cease, and the conditions on which partial or complete exemption from attendance can be obtained before the age limit has been reached. In some counties the school attendance officers are all full-time officials, and are usually under the supervision of a superintendent; in others, the work is done partly by men who have other occupations, but who were formerly the officers of school boards or boards of guardians, and have been retained either because of special fitness, or local knowledge, or because the particular council was disinclined to make sweeping changes. But as the part-time men give up their posts there is generally an endeavour to replace them by full-time officers, because the work is more efficiently done when the officers devote their whole time to it, and they can be more effectively organized and controlled.

Again, in some areas the question of prosecuting parents or guardians whose children do not comply with the attendance by-laws is dealt with centrally by a committee of the education authority, on reports from the school attendance staff; in others, the authority delegates its powers to district sub-committees.

A most important provision of the Act of 1918 (Section 8), which is to come into operation on some date to be fixed by the Board of Education, abolishes all forms of exemption from school attendance below the age of 14, and a county council is given power, subject to the consent of the Board, to raise this age to 15. The same section provides that if attendance at a private school or institution is to be regarded as satisfying the legal requirements as to school attendance, such schools or institutions must be open to inspection by the County Council

or the Board of Education, and must keep proper registers. The extension of the work of enforcing school attendance that will follow the provision of compulsory day continuation schools will probably be met by a simple strengthening of the existing organization. The Act of 1918 (Section 13) also places on County Councils the duty of enforcing the provisions of the Employment of Children Act, 1903, and certain similar duties under the Prevention of Cruelty to Children Act, 1904, more especially those relating to the employment of children in connection with entertainments. These new duties will naturally link themselves on to the arrangements for dealing with school attendance, and in some areas they will involve a substantial increase of work.

The attendance of blind, deaf, crippled, mentally defective or epileptic children at their special schools or classes is part of the general question of school attendance, but it is also intimately connected with the medical inspection of school children and the arrangements made for their after-care. It follows that, even where there has been delegation of powers as regards the attendance of normal children, it is, as a rule, advantageous to deal with these afflicted children through the medical department of the council.

Medical Inspection. Speaking generally, the relation between the health of even normal children and their attendance at school is so intimate, that some authorities arrange to deal with "attendance" and "health" through the same sub-committee. The general supervision of medical inspection is in the hands of the county school medical officer, who is sometimes also the county medical officer of health. If the offices are not combined, close co-operation between the two officers is essential. In all but the very small counties, there are also whole- or part-time assistant school medical inspectors, some occasionally being women doctors. County councils which have fully developed their organization of medical inspection and after-care of the inspected children usually have at least one school oculist and one school dentist. Some county councils have been able to establish one or more school clinics where children can be treated for minor ailments, such as ringworm, and can be examined at frequent intervals if their condition requires it. Frequently, however, the inadequacy of means of communication operates against the establishment of such clinics; and in rural counties with a scattered population much travelling has to be undertaken by the school medical staff. In view of the extended duties as to medical treatment imposed by the Act of 1918, the establishment of school clinics is likely to become more general.

Further, the Act of 1918 extends the powers and duties concerning the medical inspection and treatment of children and young persons to those attending (a) secondary schools provided by the council, (b) continuation schools, and (c) such other schools and educational institutions provided by them as the Board of Education may direct. This new work can be dealt with on the same general lines as the elementary school work, but will require an increased staff.

In connection with the medical supervision of school children, much valuable help is given by school teachers. The best organized counties have a definite system under which the head teachers at once report to the county school medical officer and

the local medical officer of health any cases of infectious illness amongst the children, thus enabling steps to be taken at once to check an epidemic. Some counties are provided with a bacteriological laboratory with a competent staff, by whom suspected cases of diphtheria, etc., can be investigated without delay.

The after-care of the medically-inspected children, which is undertaken to ensure that the recommendations of the medical inspector are acted on, is carried out by voluntary helpers, or by school nurses, or, in thinly populated areas, by district nurses, who fit the work in with their other duties.

School Buildings. An architect's department is generally regarded as a necessity in counties where the population is increasing rapidly, or where for other reasons the number of new schools to be erected is large, or the number of existing council schools necessitates a large amount of work on repairs and alterations. Counties in which this kind of work is on a smaller scale, find it better to employ a private architect when the occasion arises.

It is not in the power of either county councils or managers of voluntary schools to erect new schools or enlarge old ones just as they think fit. Whenever the building of a new school is contemplated, or such enlargement of an existing school as, in the opinion of the Board of Education, is equivalent to the building of a new school (each case is dealt with on its merits, but it may be taken that any enlargement that provided additional accommodation for more than a single class of ordinary size would be regarded as requiring the statutory notices) full public notice of the intention has to be given over a period of three months, and it is open to managers of existing schools, or any ten ratepayers in the area, to object on the grounds that the new school is unnecessary, or is not the type of school that is wanted, or for some other reason will not meet the needs of the locality satisfactorily. When any such dispute arises, the decision lies with the Board of Education under Section 8 of the Act, and the Board usually holds a public inquiry in the area concerned.

Any capital expenditure incurred by a county council for the erection of new schools, or the enlargement or improvement of existing schools, may be charged, to the extent of not less than one-half but not more than three-fourths, on the area which, in the opinion of the council, is served by the school. This holds good whether the money to meet the expenditure is provided at once out of funds in hand, or is raised in the form of a loan. No charge of the kind referred to may be made on any area smaller than a civil parish, but all parishes served by any one school may be rated in respect of it.

It may be pointed out that in the case of elementary education, it is only capital expenditure that can be charged on particular parts of the county area. All expenditure on the maintenance of schools, including centres for special subjects and "special" schools, and all administrative expenses, must be defrayed out of the general county fund raised by an equal rate over the whole area of the county.

Higher Education. When dealing with higher education, or, to use the technical phrase, "education other than elementary," (*i.e.* not provided in or in connection with public elementary schools, and



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PLATE XXVI

limited to children under the age of 15), the work of county councils may be broadly divided under the heads of (1) scholarships; (2) continuation schools; (3) secondary schools; (4) technical instruction; (5) aid to university education; and (6) the training of teachers. The views of the County Council as to what is necessary for their area under these heads must be embodied in their scheme under the Act of 1918. To make adequate and suitable arrangements for the supply and training of teachers becomes a duty under that Act, but the most notable and far-reaching extension of duties is the provision (from some date to be fixed by the Board of Education) of Day Continuation Schools which must be attended for at least 280 hours in each year by all boys and girls between the ages of 14 and 16 who are not under suitable instruction in some other manner. Seven years after the appointed day the minimum attendance will be 320 hours per year, and the obligation to attend will apply up to the age of eighteen, except as regards boys and girls who have received approved full time instruction up to the age of 16.

The schemes for scholarships, secondary schools, aid to university education, and the training of teachers, are generally planned for the county as a whole and managed mainly by the county committee. Continuation schools and technical instruction are influenced to a greater extent by the circumstances of each locality, and it is a general practice to leave the detailed management of them, and a considerable voice as to the curricula, in the hands of local committees, subject to approval of the general scheme and estimated cost by the county council, which is, of course, represented on the committee.

Wherever practicable, it is, as a rule, better to appoint the local committee, not for a single school or institution, but for the supervision of all the work done in the minor area—borough, urban district, or parish, as the case may be. Frequently these local committees are appointed jointly by the county council and the minor local authority, and this gives a representative character to the committee which is beneficial because it stimulates local interest.

Further, under the Act of 1902, borough councils and urban district councils have the power, concurrently with the county council, of spending money on higher education up to an amount equivalent to a rate of one penny in the £ over their particular area, in addition to any rate which the county council may raise in the same area for similar purposes. This is an additional reason for co-operation between the county council and the minor authority, and abundant power is given by the Education Acts for the formation of joint committees and the making of agreements as to the division of expenditure between the two bodies. Formal agreements of this kind are almost always entered into when the scheme of work agreed on involves large capital expenditure on the provision and equipment of buildings. Arrangements for co-operation between education authorities are made easier by the provisions of Section 6 of the Act of 1918, which also provides for the voluntary federation of such authorities over comparatively wide areas.

In addition to local committees, some of the larger counties have thought it advisable to appoint district committees, which deal with a group of the minor areas and exercise general supervision over

the schemes of work, etc., with a view to securing co-ordination and preventing overlapping and waste of effort.

The county council has power to charge the whole or any part of the expenditure on higher education, whether for maintenance or for capital purposes, on the parish or parishes which, in the opinion of the council, are served by the particular school or class.

The extent to which the cost of higher education is defrayed out of the county fund and out of a local rate respectively varies considerably according to circumstances. Those sections of the work which apply to the county as a whole are generally paid for entirely out of the county fund; but in the case of schools and classes that are of special benefit to a particular locality, it is not an uncommon arrangement to divide the expenditure equally between the county fund and the local rate. The county council, as already stated, has power to deal with each case on its merits. C. H. B.

COUNTY SCHOOLS, WELSH.—(See SECONDARY EDUCATION IN WALES.)

COURT INFLUENCES AND CHILDREN ACTORS IN THE DEVELOPMENT OF PRE-SHAKE-SPEAREAN DRAMA.

Side by side with the new drama of native human instinct in English at the Court (see DRAMA IN THE TUDOR COURT AND CHAPEL ROYAL, ORIGIN OF MODERN ENGLISH), there was developing in the universities and schools a Latin drama, based on the classics and on the Dutch, German, and French school drama in Latin, of a religious turn, in the early sixteenth century, such as the "Dialogi" by Ravisius Textor, the Prodigal Son comedies of "Asotus" and "Rebelles" by George Macropedius, "Acolastus" by William Gnaphacus, "Studentes" by Christopher Stymmelius, the theological "Pammachius" by Thomas Kirchmeyer, and the like. The practice was begun on the Continent in the Middle Ages, the most notable examples being the secular school dramas by Hrotswitha at the Convent of Gandersheim in the tenth century. English universities and schools took it up in the fifteenth century. From 1525 onwards, and possibly as early as the beginning of William Lyly's mastership of St. Paul's School in 1512, it was the annual Christmas pastime of the boys as actors in various schools. Typical of all (as continued from early Tudor days on through Elizabeth's reign and beyond, even, in the case of Westminster, to the present) may be cited Roger Manwood's Foundation for Sandwich Grammar School, Kent, in 1580, ordaining that Latin be taught to all the forms, "that the master and vshe do vsually speak in the Lattyn tonge to their schollers that doe vnderstand the same," and "at everie Christmas tyme, yf the master do thincke mete, to have one comedie or tragedie of chaste matter in Latin to be plaied, the partes to be devided to as many schollers as maie be, and to be learned at vacant tymes" (W. Boys, *Hist. of Sandwich*, 1792, p. 231). While preference may have been given for a time to Plautus and Terence, the boys of St. Paul's, Eton, Hitchin, Westminster, Merchant Taylors, and other schools performed also plays written by their masters, notably, William Lyly (1512-1522) and his son-in-law and successor, John Rightwise (1522-1531) at Dean Colet's re-founded school of St. Paul's; Nicholas Udall at Eton (1534-1541); Ralph Radcliff at Hitchin (1538 ff.); Richard Mulcaster at Merchant

Taylor (1561-1586); John Taylor and William Elderton at Westminster (1566-1574); Thomas Ashton at Shrewsbury School (1561-1569); and others of lesser note. Master Radcliff even erected a stage in his school in the old monastery at Hitchin.

The **Latin Drama** aimed primarily to inspire devotion to the new learning and to cultivate linguistic fluency rather than to attain literary ends or to minister to pleasure. Scholars affected to speak Latin, and the dialogue of drama was found a good pedagogical means to conversational practice, as exemplified by Melanchthon at Wittenberg (1497-1560), Sturm of Strassburg (1507-1589), and the more cosmopolitan Erasmus (1466-1536) and J. L. Vives (1492-1540); and the English masters Lyly, Rightwise, and the rest. It was almost purely pedagogic in its aims, sugared with just enough pride in public performance to make it palatable. It was practised in other schools besides those here named, many of which doubtless have left us no record of such mere school exercises, and it is of interest almost solely as an educational instrument. It did not influence, nor was it influenced by, the drama of native instinct in English evolving through the Court, just as still is the case at Westminster with reference to the English drama of to-day, nor can the schoolboys who acted it properly be regarded as dramatic companies so long as they confined themselves to these school exercises. Certain of them took on that character for the first time when they began, under Elizabeth, to present plays at Court in English in imitation of the Children of the Chapel. They require, therefore, no further notice here.

The Latin school drama was closely linked with the Church drama, aiming to teach religion and morality as well as to cultivate the Latin language. Some earlier ones were Catholic; some later, Protestant; some controversial; few merely secular; none aiming at sheer entertainment. Good examples are Radcliff's ten plays, as reported by Bishop Bale: "De Patientia Griselidis," "De Meliboeo Chauceriano," "De Titi et Gisippi amicitia," "De Sodomeae incendio," "De Io. Hussi damnatione," "De Ioniae defectione," "De Lazaro ac diuite," "De Iudithae fortitudine," "De Iobi afflictionibus," and "De Susannae liberatione." At Shrewsbury a close linking of the religious drama and the Latin drama is shown in Thomas Ashton, who required the performance of one act of a Latin drama by his pupils each week, and also wrote popular religious plays in English, his best being "The Passion of Christ" (1561), which were acted in the old stone-quarry at Shrewsbury as an amphitheatre, reported by the contemporary Salopian poet, Thomas Churchyard, to have accommodated 10,000 to 20,000 spectators at Ashton's performances. During his three years of school-life here under Ashton, Sir Philip Sidney may have got those notions of the drama which led him, about 1580, to make that imaginary description of acting on the unlearned public stages, so often taken as literally characteristic of the stage of that and later times—even of the Shakespearean stage—though utterly untrue of it.

Drama under Edward VI and Mary. The degeneracy of Court entertainment under Edward VI in the form of antic performances by the Lord of Misrule was succeeded in the Court of Catholic Queen Mary by an austere reversal. There the didactic, cloister spirit common to the humanistic school drama and the Catholic Church drama came

into sharp contact with the spirit of pure play, pleasurable, sheer entertainment of the native English drama handed down from the days of youthful joyousness in the Court of Henry VIII. The cause lay partly in the attempted revival of the Church drama under Mary, but mainly in her appointment of the former Eton schoolmaster, Nicholas Udall, as Court poet, who, trimmer to the wind as he was, laying aside his Protestant professions and the Latin language of the school, tried to adapt the classic form and the Catholic or Morality spirit to the unclassic Court vogue of light interlude descended from the days of Cornish, in such polytypic results as "Genus Humanum," "Respublica," "Ralph Roister Doister," and "Jacob and Esau."

The Children of the Chapel, supplemented in part by the gentlemen of the Chapel, continued to be the principal actors at Court in these and other plays that temporarily hindered the direct evolution of the drama.

Contrary to the usual view, the new evidences show that these hybrids by Udall and their like, as "Jack Jugeler," "Gammer Gurton's Needle," "Gorboduc," "Jocasta," "Supposes," "Tancred and Gismunda," and others acted at schools, universities, and inns of Court were not the prototypes of the modern English drama, in the sense of being vital sources out of which it evolved, nor even in the sense of largely influencing it. Rather were they belated attempts of the humanists to stoop to the level of unclassic English demands which were satisfied only by the new native drama as long presented by the Children of the Chapel at Court.

Schoolboy Actors. Following these Marian hybridizations came the rapid restoration and renewed normal evolution of the native English drama with the accession of Elizabeth in 1558. Henceforth the gentlemen of the Chapel ceased to act, and greater demands than ever were made upon the boy actors. The Children of the Chapel were strengthened; the choir-boys of St. Paul's, under the Queen's old-time friend Sebastian Westcott, who had occasionally entertained her in her princess days, were invited to play at Court in the first year of her reign and every year thereafter for nearly a quarter of a century, till Westcott's death in 1582; the Children of her Chapel at Windsor under Richard Farrant, after 1564, were likewise employed annually in plays at Court; the grammar-school boys of Westminster after 1566, first under the mastership of John Taylor and afterwards under William Elderton; the boys of Eton under Elderton in 1572; and Merchant Taylors boys, under Richard Mulcaster in 1572-1583, were also invited to Court.

At the death of Bower in 1561, the Queen, with an eye to dramatic development, appointed Richard Edwards as master of the Children of the Chapel. Edwards was by far the best poet, musician, lyricist, and dramatist that had graced the Court since the days of Cornish, and was his superior in both conception and expression. During his short, brilliant career to his death six years later, he produced play after play with the children of the Chapel at Court, such as the well-known "Damon and Pythias," "Appius and Virginia," "Misogonus," and "Palaemon and Arcyte." Nothing so good had ever been seen in England before, and Court and public were carried away with zeal and admiration for the new drama thus restored and advanced.

Contrast with the recently preceding efforts heightened the estimation of excellence.

Passing over the period of the Marian hybridization under Udall as if it had not been, Edwards carried on the traditions of the native Court drama begun by Cornish, and gave it an impetus, not only at the Court but in the country, that was destined to last beyond the time "while child and Chapel dure," as then foreseen by his admirers.

Developed from Cornish's interlude into the form of "tragical comedy," as Edwards named it, this drama of native human instinct was carried on by his successor, William Hunnis, after 1566, with the Children of the Chapel as actors; and by Richard Farrant, with the choir-boys of Windsor: at first acting separately, and from 1576 to 1580 together, in such plays, with realistic setting and scenery, as "The Tragedy of the King of Scots," "Ajax and Ulysses," "Narcissus," "Quintus Fabius," "King Xerxes," "The History of Mutius Scevola," "The History of Loyalty and Beauty," "A History of Alucius," and many others.

The Royal vogue of drama practised by the boys at Court spread to all other boy actors and men actors invited to Court. Indeed, outside companies were invited solely on the ground of being able to adapt their drama to Court demands for the Royal vogue. Its influence is visible throughout the plays of outside companies of both boys and men who attained the privilege of playing at Court, from their first identifiable examples in 1571-1572 on through their increasing numbers up to Shakespeare. It reacted also on the formation of companies as well as on the drama they cultivated, percolating slowly down from Court to nobility, from nobility to people, through companies allowed to form and travel under patronage of nobility in imitation of Royalty, thus gradually bringing to the people the sort of entertainment that was known to please my lord or the King or Queen. Under this Court stimulus, such legitimately patronized companies grew from practically none during the first years of Henry VIII to more than 150 during the reign of Elizabeth, or three times the total number of fifty companies formed during the whole fifty years preceding the beginning of Elizabeth's reign in 1558.

The Rivalry of Adult Companies. Prior to Elizabeth, outside companies had been practically excluded from Court, and so had been able to follow Court methods in drama only from afar, and the antiquated morality from a nearer intimacy. Under Elizabeth, the radiating centre of all influences, they rapidly took on the essential features of the Court drama. It was their ambition to play before the Queen. During the first fifteen years of her reign (1558-1573), the plays at Court were almost wholly by the boys of her two Chapels and St. Paul's. Only eight times were men companies invited. During the next fifteen years (1574-1589), both men and boy actors at Court increased in rivalry for supremacy, which the men finally gained and held, the boy companies breaking up or ceasing effort, until about 1598, when the Children of the Chapel at Blackfriars and, shortly afterwards, the boys of St. Paul's, again challenged the field, only to yield supremacy, after a few years, to the master art of Shakespeare and his company and the intervention of the new sovereign, King James, in 1603, against the boys in favour of the men.

Except in the provinces or in provincial minds least in touch with the Court of Elizabeth, the old-style plays or moralities, which still clung feebly

to life, came to be regarded as stale and unprofitable. It was the drama of native human instinct and primitive human passions begun by Cornish under Henry VIII that was steadily evolving at the Court of Elizabeth through the Chapel Royal boys as actors, and their masters Edwards, Hunnis, and Farrant as poets, and finally through the other boy actors and men companies that swung into rivalry with them in their own domain.

Nor was the drama classic in any sense. The classicists, too, who came least to Court remained classic the longest, and those who did come, left classic form and spirit and language behind. The dramas of the Chapel boys at Court were in English. So were the plays presented by Westcott's boys of St. Paul's through a period of twenty-nine years, and by their successors. When the grammar schools of Westminster, Eton, and Merchant Taylors came to Court, they likewise presented only English plays, although at their own schools they acted only Latin plays. Also, all plays by men companies, both at Court and before the public, were in English, and aimed at sheer entertainment. Court and people loved life; and when they sought entertainment, the way once being opened, they demanded, not the didacticism of lifeless moralities and the intellectual exercise of Latin drama, but life's reflex, relaxation, play, that which touched the native impulses and afforded pleasurable sensations of having drunk quick draughts of the wine of life—song, dance, mask, lively fancy, witty dialogue, comical situation, melodramatic excitement, pleasing show. No musty moralities nor classic drama for them—only pungent English.

Thus to Court and people, not to Church and classic learning, was left the development of the new English drama through and around this Tudor Court centre, with the Chapel boys and, later, other schoolboys as actors.

C. W. W.

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COUSIN, VICTOR (1792-1867).—He was educated at Paris; took up the study of the philosophy of Locke and the Scottish metaphysicians, and lectured on philosophy and literature at the Paris University. In 1817 he visited Germany and studied the philosophy of Kant, Fichte, and Hegel. On his return to France, he resumed his professorship at the Sorbonne, and between 1820 and 1827 published editions of Proctus and Descartes. His readers and hearers were numerous and enthusiastic, and for some years he was the leader of opinion in Paris. In 1830 he became a member of the Council of Public Instruction, and later the Director of the École Nationale. He organized primary education, and issued valuable reports on the state of public instruction in Holland and Germany. The revolution of 1849 put an end to his public career. Cousin was the founder of systematic eclecticism in modern philosophy. His system includes a definite method of observation, analysis, and induction, with a

definite criterion of truth. It comprises psychology, and is opposed to idealism, scepticism, and mysticism as incomplete systems.

COWLEY, ABRAHAM (1618–1667).—Was educated at Westminster School, where he wrote a pastoral comedy called "Love's Riddle"; and in his fifteenth year (1633) appeared his *Poetical Blossoms*, including "The Tragical History of Pyramus and Thisbe" (written at the age of ten), and "Constantius and Philetus" (written at the age of twelve). Cowley went to Cambridge in 1636, and while there continued to publish poems, and wrote several plays which were performed at the University. On the outbreak of the Civil War, he went to Paris, and was employed by the Queen Henrietta Maria in her correspondence with her husband. He published a number of love poems in 1647, under the title of *The Mistress*. He returned to England in 1656, and lived quietly till Cromwell's death, devoting himself to scientific studies, especially to botany. At the Restoration, he was neglected by Charles II, who showed no gratitude to him for his past services.

In 1662, he published two books, in Latin verse, *Of Plants*, and subsequently added four more volumes to the series. His *Culler of Coleman Street*, and an ode in praise of Brutus, were taken to be attacks on the Royalist party, and brought on him the anger of Charles II.

Cowley wrote numerous *Essays* on rural and peaceful subjects, characterized by lively fancy, and elevated thoughts, and interspersed with charming snatches of poetry. He spent his last seven or eight years in retirement by the Thames.

COWPER TEMPLE CLAUSE, THE.—The Education Act, 1870 (Sect. 14), enacts that, in respect of every school provided by a School Board, "No Religious Catechism or Religious Formulary which is distinctive of any particular denomination shall be taught in the school." This section is known as the "Cowper Temple Clause." It must not be confounded with the "Conscience Clause" under which the parent of a scholar may withdraw such child from religious teaching. When the Education Bill of 1870 was presented to Parliament, it provided, *inter alia*, for the establishment of School Boards by Town Councils and Country Vestries, and proposed to give to these Boards the power to determine the religious teaching (if any) to be given in the various schools which would be built and maintained by such School Boards with the assistance of moneys provided by local rates. The School Boards were also to be empowered to assist financially the then existing Voluntary Schools, in which religious teaching of a distinctly denominational character was given. To these proposals strong opposition was raised, both in and outside Parliament. The Amendment to the Second Reading of the Bill had reference almost entirely to this question. Nonconformists expressed their strong objection to the endowment of various forms of religious teaching, and it was alleged that the religious question would be a source of constant trouble in the selection of School Boards. Owing to assurances given by the Government, the Amendment was withdrawn; but when the Bill was about to be considered in Committee in the House, Mr. Gladstone stated that he proposed to accept an amendment which had been placed upon the Notice Paper of the House by Mr. Cowper Temple (Member

for South Hampshire), namely, that in schools "hereafter established by means of local rates, no catechism or religious formulary which is distinctive of any particular denomination shall be taught"; and, further, that the Government intended to abandon the proposal that the School Boards should be empowered to assist Voluntary Schools out of the rates, and in lieu thereof to increase the Parliamentary grant payable to such schools, and, as a natural corollary, to increase by a like sum the grants proposed to be paid in respect of schools established by School Boards. This decision was in the nature of a compromise between those who desired that the teaching in the schools to be established by School Boards should be purely secular, and those who desired that the School Boards should have the power to determine the nature of the religious teaching without restriction. A few of the School Boards subsequently established decided to exclude all religious teaching, but, in the great majority, Bible teaching was given, and the Lord's Prayer and Ten Commandments very generally taught. In many, the Apostles' Creed was taught, and such teaching was sanctioned by the Board of Education. When, under the Education Acts of 1902 and 1903, School Boards were abolished, the obligation created by the Cowper Temple Clause was transferred to the new Local Education Authority, and all religious teaching in Council Schools is subject to the provisions of this Clause. But the proposal that the Local Education Authority might assist Voluntary Schools out of the rates was revived in 1902 and carried into effect, subject to regulations respecting control over secular instruction in such schools by the Local Authority.

Secondary Schools. The Act of 1902 also gave to the Local Education Authorities (then constituted) the duty of providing education other than elementary; and, by Section 4 of that Act, the Cowper Temple Clause was made to apply to schools other than elementary provided by the Local Education Authority, with the following modification, namely, "That the Council, at the request of parents of scholars, may allow any Religious Instruction to be given in the School, College or Hostel otherwise than at the cost of the Council"; so that, whereas in the Elementary Schools maintained by the Council distinctive denominational formularies may not be taught, such formularies may, on request, be taught in a Secondary School without cost to the Council. The Clause does not apply to Secondary Schools aided but not provided by a Council. The question is sometimes asked: "How can a Local Authority be compelled faithfully to observe the provisions of the Cowper Temple Clause?" Assuming that the control of the electorate over the Local Authority be insufficient for the purpose, an aggrieved ratepayer may direct the attention of the Auditor to any expenditure by an Education Authority on religious teaching given contrary to the Provisions of the Act of 1902, with a view to the disallowance of such expenditure, or, failing in this direction, he may by legal process obtain an injunction restraining the Local Authority from any such illegal act.

E. GRAY.

COWPER, WILLIAM (1731–1800).—He was born at Great Berkhamstead, Hertfordshire, educated at Westminster School with Warren Hastings, and called to the Bar in 1754. Nervousness, followed by

fits of depression, culminated in intermittent madness in 1763; and he spent most of his remaining years at Olney in association with John Newton, curate of the village; Mrs. Unwin; and Lady Austin. Under their influence much of his poetry was written. With little knowledge of the world and a hatred of town, he moralized at length in *The Task* (1785), *Table Talk* (1780), *Expostulation* (1780), and similar poems. He also wrote *John Gilpin*, *Boadicea*, *Alexander Selkirk*, *The Castaway*, and the *Olney Hymns*—the best known being “Hark, my soul! it is the Lord,” and “God moves in a mysterious way.”

CRABBE, GEORGE (1754–1832).—The son of a warehouse keeper of Aldborough, Suffolk, who was educated at various village schools in that county, and in 1780 went to London to try his fortune in literature. He had previously written verses for publication in magazines, and after a year of difficulties he secured the patronage of Edmund Burke, who gave him liberal assistance and introduced him to Fox, Johnson, and Reynolds. He was ordained in 1783, and became curate of his native town. He held livings in various villages in the Eastern Counties until 1813, and ended his life at Trowbridge. Crabbe wrote much poetry, modelled largely on the style of Pope, and dealing with the anxieties and sufferings of the lower and middle classes especially in the country, and portraying the common English country scenery and society of his time. He was an important figure in the change of English literature from the eighteenth century to the nineteenth. His chief works are *The Village*, *The Newspaper*, *The Parish Register*, and *Tales of the Hall*.

CRAFTS AND EDUCATION.—The great industrial changes of the nineteenth century had their effect no less upon social than upon economic life. Of many unforeseen results, one that is hardly yet realized is the effect of the new conditions on the life of children.

Before the “age of machinery” many handicrafts that have now disappeared were an important element in the common life of every town and village. They formed a vital part of the education and unconscious training of children: the various crafts, common and necessary to every household, were a familiar part of early experience. Children were accustomed to see and to share in many kinds of work that now have become unfamiliar. Little is left of the old craft influences that were universal until the end of the eighteenth century. The making of the things of everyday use are now mysteries beyond the knowledge and outside the experience of children. All but the blacksmith’s shop have gone, and, with the crafts, the system of apprenticeship has also lost its old familiar character.

The loss of these sources of unconscious training of the constructive faculty has, moreover, been accompanied by an increase of the care and time that are given to the training of the intellect, to the acquirement of knowledge unrelated to experience, and of information about unrealized facts.

In earlier times school instruction had been a small and merely supplementary part of children’s education, which was largely gained by unconscious association with the work and activities of common life. The training of the intellectual faculty has

now increased out of all proportion to the training of the constructive and creative powers of mind.

Crafts in the School. During recent years many efforts and experiments have been made with the aim of restoring the balance between the intellectual and the creative elements in the education of children. Manual training has become an established part of the education of most boys. Some “constructional work” is usually made a part of the training of girls. Crafts in wood, metal, leather, stencilling and needlework are becoming more and more common as a part of school life. Each of these has its uses and special applicability to the various types of day schools. The difficulty is in finding time in the already full curriculum of school work. The value of the crafts is, however, becoming fully appreciated, and in most schools of standing to-day some craft work is introduced throughout the course in addition to the drawing class.

A commonly accepted method is to begin with a course of “constructional work” in junior classes of from 8 to 10 years. Exercises are set in exact folding and cutting of paper with scissors and, by pasting the parts together, models are made of boxes and familiar objects of simple form, followed by more advanced work in cardboard, wood and cloth. After this junior course the boys usually proceed to manual training, in which they practise the use of the tools of the joiner and carpenter; the girls meanwhile proceeding to craft work in embroidery, or to light crafts such as the designing and stencilling of patterns upon suitable fabrics, the tooling of leather or, in some schools, to painting on pottery.

Experiments have recently been carried out successfully in the craft of block-printing in colour from designs cut into the surface of linoleum and printed by a hand press. By this means useful illustrations may be made for the school magazine or decorative printing for school notices. Some quite successful work of the kind has even been done in elementary school work as part of the art course, and in several secondary schools in London and in Scotland.

There is found, however, to be a danger in adopting certain craft methods such as, for example, “poker-work,” and similar makeshifts which pass for crafts. When tools and materials are too easily used both the workmanship and the quality of artistic design tend to deteriorate. In every craft there is a special discipline, and the value of this is lost if materials and tools are provided that make little demand upon skill in their use. Much “amateur” craftwork becomes trifling and worthless, as well as wasteful, for this reason. Many, also, of co-called “recreative” craft classes in rural districts lead to a degenerate kind of design and to a disregard of workmanship. The danger of this abuse of tools is obvious, yet its results are unfortunately prevalent under misguided teaching. Experience has shown, however, beyond question, that the simpler crafts, as an adjunct to the drawing class in school work, are of great value in providing an incentive to artistic study and in fulfilling an important service in the training of taste. It is very necessary, however, that the object of craft training in schools should be clearly understood to be the training of the constructive and creative faculties, which the artificial conditions of modern life tend to neglect and to stultify. It is equally important that the

true discipline of each craft should be maintained by proper standards of design and workmanship.

Writing. One of the simplest, yet most important, of all the primitive crafts is the craft of writing. This necessary part of school work need not be the dull and tedious exercise to which our copy books and commercial script have reduced it. A teacher with imagination and knowledge of his subject may present this craft to the minds of children with some of the living intensity of its first meaning to the life of civilized man, by awakening their sense of the nature of the problem, showing them some of the steps by which its gradual solution was made, and leading them to its culmination in the noble achievement of the Romans whose superbly designed letters have served us in daily use, unaltered in their main form, for 2,000 years.

The value of the careful study of lettering and formal writing can hardly be over-estimated. As a part of school training it has great scope and usefulness in developing skill of hand and the sense of fine form. By familiarity with the finest examples of the form of letters a standard may be unconsciously established in the minds of children which will influence and purify their taste and set its mark upon the style even of casual and ordinary writing. The letters of the alphabet are admirable objects for careful study. They are best drawn to a fairly large scale (about 3 in.) and the "small letters" written with a broad pen. Illuminated capitals may be added to the written work.

In the equipment of a class for craft work in lettering well chosen examples of the Roman letter are a first essential. Large photographic reproductions of the great monumental inscriptions are obtainable. An excellent sheet is published of both capital and small letters designed and adapted from the Roman examples by A. E. R. Gill. A useful analysis of the Roman capitals is given in Edward Johnston's work on writing, illuminating and lettering, in which he draws attention to many refinements of detail and distinctive points that would ordinarily escape notice. His book also gives in detail the methods for preparing the tools and materials of the craft and the particulars of all its processes.

The interest that may be given to this teaching will naturally depend on the interest and knowledge of the teacher, and upon his power to transform the dry bones of Paleography into a living art or game of skill that children will eagerly pursue.

After the elementary study of the capital letters comes the beginning of formal writing with a broad-nibbed pen.

For any purpose where writing needs to have carrying power, so that it may be legible at a moderate distance, a stronger instrument than the modern fine-pointed steel pen is required. The broad quill or reed pen of the Latin and mediaeval scribes is the perfect instrument for formal writing. Addresses on labels, on parcels and packing cases, written notices to be placed on walls or notice boards, and many kinds of temporary advertisements are best written with a broad-nibbed pen, indeed they cannot be made so effectually by any other means. The art of formal writing for these practical purposes is easily acquired, and its early practice is a far better training in the rudiments of handwriting than the methods commonly in use in the writing class in most schools at the present day. The equipment needed for the work is slight and inexpensive. Several steel pen manufacturers

produce a series of pens of varying widths of nib, and both reed and quill pens are readily obtainable.

F. M. F.

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CRAMMING.—This technical term for processes of feeding by which animals are brought to an abnormal condition of fatness has long been metaphorically applied to analogous processes in education. These are developed by faulty methods of examination, especially in pass examinations intended to test throughout a school the results of teaching. In elementary education, for instance, under the system of "payment by results" (*q.v.*), the grant to the school, and even the salary of the teacher, were regulated largely by the mechanical proficiency of the scholars in work often of small educational value, such as the memorizing of English spelling. Teaching of this kind had much to do with the gradual deterioration of intelligence and interest which has often been observed as a paradoxical result of schooling.

Such methods are effectively disestablished by the system which substitutes inspection of methods for examination of results. In competitive examinations for the award of scholarships preparation by cramming is rendered futile by making the examination a test, not of success in acquiring knowledge, but of capacity to use knowledge when acquired. A powerful influence in the same direction is exerted by the direct method of teaching languages, which discourages at all stages the acquisition of knowledge which cannot at once be made vital by use.

In examinations intended for adults other considerations may be taken into account. The task of acquiring for a special purpose effective mastery of detailed and various knowledge is in itself, for the adult, a valuable test of capacity.

C. SIMMONS.

CRANIOMETRY.—This is a division of the science of anthropometry, the measurement of the dimensions and proportions of the parts of the human body for the purpose of comparison and identification. Cranial measurements are very important to anthropologists; but they differ so much among the members of the same race, and even of the same family, as to prevent the anthropologist from basing safe generalizations upon them. The conformation of the skull is taken as a criterion for broad distinctions between races.

Mode of Estimation. The chief mode of estimating is to obtain the ratio between the two dimensions of the skull—length from front to back and width from side to side—as it is viewed from above. Retzius takes 100 to represent the length, and divides skulls into dolichocephalus (or long) and brachycephalus (or broad). In the former, the width is below 80 and, in the latter, above 80. A third class is sometimes included, as intermediate, in which the width is 75 to 80. The percentage obtained by measuring a large number of skulls is called the cephalic index. The Negro or the Australian native gives an index of 72, the Tartar may be as high as 88; the European average is 78. In the same way, standards of height have been obtained. Height varies less than width, and ranges from 77 among the Malays and 74 among Mongolians and Fijians to 71 among Europeans. The

back view is generally distinguished by its shape, as rounded, pentagonal, etc.

Projection of Jaw. The position and degree of projection of the jaw is important, because the great distinction between man's skull and that of an animal is in relative prominence of forehead and jaws. The face of a man extends vertically (or nearly so); and prominent jaws indicate an approach to an animal type, especially if associated with a receding forehead. The degree of projection of the jaw is indicated by the gnathic index of Flower, in which the base-alveolar length is compared with the base-nasal length. The front of the Australian native's skull is prognathous, with an excessive projection of the jaw; that of the African is mesognathous, with less projection; while that of the European is orthognathous, or upright. The facial angle of Camper depends on the position of the jaw, and has been taken by him as a test of high and low races. He drew a line from the centre of the forehead to the most projecting part of the upper jaw, just above the incisor teeth, and another from the base of the nasal opening to the opening of the ear; between these lines was the facial angle.

Some anatomists, such as Blumenbach and Retzius, have attached much importance to cranial capacity; and have come to the conclusion that civilized races have larger cranial capacity and, therefore, larger brains than uncivilized races. The capacity is obtained by filling the cranial cavity of the skull of an adult with sand. The capacity of normal human skulls vary from 60 to 110 cub. in., the average being 85 cub. in. The Eskimo average is 91.5; European, 90.3; Mongolian, 87.3; Negro, 82.4; and Australian native, 79.3.

The general results of cranial measurements show that, in some cases, great reliance may be placed on them.

CRANMER, THOMAS.—Born 1489 in Nottinghamshire of a well-to-do family, Cranmer is known to the world rather as an ecclesiastic, interested in Theological and Liturgical questions, and concerned with religious controversy, than as an Educationist. He was, of course, a product of the New Learning, but, in the days of his earlier activity at Cambridge, where he was a Fellow of Jesus College, he took so little part in the cause of educational advancement, that his very existence is ignored by his contemporary Erasmus. Later in his career he produced a catechism which is called after his name, and is said to have been largely translated from a Latin catechism compiled by Justus Jonas. There are also reasons for thinking that he, together with Bishop Ridley, drew up the first part of the smaller catechism, now in use in the English Church, which was revised, with additions, by Dean Nowell in 1570. To this extent, at any rate, he interested himself in the instruction of the young.

In 1533 he was appointed Archbishop of Canterbury, and, during the twenty-three years of his episcopate, he was chiefly engaged in controversy. The greatest achievement with which he can be credited is the production of the first Prayer Book, 1548, where his admirable gift of liturgical expression is abundantly illustrated. Some of the collects, which are known to be his translations or compositions, are masterpieces in that most difficult medium. How difficult it is can be seen in our own times when new collects are put out by authority

for use on special occasions. The art, indeed, is as difficult as that of writing sonnets. Not everything that calls itself a collect is one in the artistic sense, any more than a sonnet is a sonnet simply because it professes to be such.

This is not the place to consider Cranmer's relation to the divorce of Catherine of Arragon, to his attitude toward the Papal supremacy, to his treatment of Anne Boleyn, and to his writings and acts, which led finally to his being burnt at the stake at Oxford. These matters are outside the educational sphere, but it is possible to connect him with education by reason of his spirited defence of what was known as the Great Bible, the excellence of which can be judged on the strength of the portion which still forms the Psalter of the Book of Common Prayer. Cranmer had the misfortune to live in a brutal age, in which those who happened for the moment to be in the ascendant made martyrs equally of him and men of so different a type from his as the Blessed John Fisher and the Blessed Thomas More.

A. REYNOLDS.

CREAKLE'S SCHOOL. — (See BOARDING SCHOOLS.)

CRETINISM.—A special form of defective mental development accompanied by bodily deformity or retarded physical development. It occurs frequently in the deep lower valleys of the Alps and Pyrenees, and in the mountains of Southern Asia. The victims of this disease usually suffer from goitre, an enlargement of the thyroid gland. They are always pitiable objects and often repulsive to look at, besides being dirty in their habits. The mouth is large and open, the tongue protrudes, the eyes are small, and the skull is abnormally broad and flattened above. (See also MENTALLY DEFICIENT CHILDREN.)

CRICKET.—It is well to say at the beginning of this article that a coach of cricket to boys will not have an easy task, and will be subject to many moods of depression and elation. At one moment he may, by chance, find himself turning out several boys in one eleven possessed of original genius. At another time he will find nobody of ability above the average, and straightway he is plunged into the profoundest depression. If he knew the truth, he would not be too much elated in the one case or depressed in the other. The success of the genius is because he is a genius, and very little is due to the coach; and supernatural powers will avail little when brought up against mediocrity. The first duty of a coach is to ascertain if a boy has any eye or aptitude for the game; if he has none, the coach should advise him to take to rowing, or possess his soul in patience and wait for winter and football. If a boy has no eye, nothing will ever make him a batsman; and if he has no natural spin, or break, or accuracy, he will never make a bowler. But when a dozen or more boys turn up to be coached for cricket not having ten talents or even five, but only one, it is under these circumstances that the coach has a chance of proving his worth.

Bowling. We will take the case of bowling first, because, as compared with batsmen, bowlers are few, and therefore they are more valuable in these days of perfect wickets. The coach should arm himself with a bat, go to a wicket and get the boy to bowl to him, and he will then be in a position to see whether the boy has any natural gifts as a

bowler. These natural gifts may be limited to three:

1. **SPIN.** The power to make the ball come fast off the pitch;

2. **BREAK ;**

3. **ACCURACY of length and direction ;**

and of these, spin comes by nature, and no coaching in the world can produce it. Break may be taught, but only by making the bowler hold the ball in a different way, or teaching him to turn his wrist or fingers so as to produce a turn or break, and there is great danger that in the acquisition of this gift the bowler will lose all length and accuracy, and break without these is worth nothing. Accuracy of pitch and direction may be taught, and, to a slight extent, break also ; and, bound up with this is the whole art of varying pace and length, and trying to find out the weak points of a batsman.

We will assume, first, that the coach finds a boy with a natural spin, and break, and fair accuracy, and the coaching of such a boy is an easy task, and the instructor's duties are of a negative kind. The bowler has the necessary gifts, but these will be lost if the boy bowls too much or too fast. The wise coach will, therefore, see that the boy does the proper amount of bowling, enough to keep him in proper tune, and not too much to disorganize him. This point is all-important, because experience has taught that spin—a gift of the gods—is the first thing an overbowed bowler will lose. Then, as to the proper pace, and what this is, any experienced coach can see for himself, and will check at once the tendency to bowl too fast. All the gifts—spin, break, and accuracy—will vanish if the bowler attempts more than his natural speed, as he loses control of himself and soon gets tired.

Another very common fault is an inordinately long run; but if a youth is inclined to this, he can probably be taught the right way without spoiling his efficiency. If there is a run of 15 yds. every ball, not only does the bowler soon tire, but there is a great waste of time, and the bowler's career is a short one; he breaks down somewhere in the legs or side. It is quite possible to bowl very fast with quite a short run.

As far as we have gone, the coach's task has been easy ; but to make a bowler with one talent into a bowler of two is the most difficult undertaking a coach can have. We are inclined to think that all that can be done is to improve the length and direction, and this an intelligent boy ought to be able to do for himself by practice. The last point is to teach the boy to observe the batsman, and to find his weak points.

There is nothing more to say, for *nascitur non fit* is absolutely true of a bowler. Practically all the coach can do is to preserve the boy's natural gifts, for the creation of them is impossible. For boys between 10 and 14, the ball should be under size, and the wickets should be 18 yds. in length instead of 22.

Batting. In the case of batting, more can be taught than in bowling. The first difficulty is to teach the boy to keep his right foot firm and not to draw away towards *short leg*. It is an instinct in the boy, as he objects to getting hit ; but as long as he draws away he cannot become a batsman. The wicket, therefore, should be smooth and, for a beginner, the bowling should not be very fast; and the youth should not take part in matches with full-grown men. The boy should play till he is 14 years old with an under-sized bat, and stand with right foot firm and just clear of the leg stump.

The next point is how to play to balls of a different length, whether back or forward. In the case of medium and fast bowling (on hard and fast wickets) many, if not most, balls can be played by reaching out, or forward play, with the left leg stretched right out ; others by back play, when the weight of the body is thrown upon the right foot. It depends on the length, and, if the ball is short, the batsman should play back and keep the left shoulder well forward ; if well up, reaching out so that the bat should get as near to the pitch as possible. If the bowling is medium or fast, and the wickets dry, teach the boy to play forward hard, and many a time by so doing the ball will be sent to the boundary. But there is only one proper way to play a half volley, and that is to hit it with almost (not quite) the batsman's full strength, and there is a difference too subtle for definition between a hit and forward play, however hard. The judging of length must be left to the batsman's eye, and, if he has not got an eye, no coach can give him one.

If a coach sees that a boy has natural ability for hitting, do not cramp his natural gifts, but encourage them. If he has a good eye, he will make many a "fourer" off balls which would bowl him out if he tried steady play at them; for steady defence is not his line. When the boy has learned to play *straight* and to *drive*, he has learnt pretty much all that a coach can teach him as far as straight bowling is concerned; the hitting of crooked balls the batsman must find out how to do by himself. *Cutting*, the most beautiful hit of all, must come by nature, for it depends mainly upon wrist play; and, as a rule, hard driving batsmen are not great at the cut. But all boys should be taught, in driving the ball on the offside wide of the wicket, to put the left leg well across, and get as near to the pitch of the ball as possible.

One fault is very hard to eradicate, viz., the tendency to pull a leg stump ball, with the result that a ball which should be driven forward with a straight bat is mowed round to leg ; and, if the batsman is not bowled, he is leg before. All that can be done in such a case is to keep on bowling such balls in practice to the boy and get him out of it ; but this is very difficult.

Slow bowling requires different methods. There should not be so much forward play, and, to balls well up, the batsman can often leave his ground and get out to the pitch and hit; there is no time to do this to a fast ball. Slow bowling must be met by less stereotyped methods : it is more variable and full of tricks and, on the whole, is more difficult. The batsman must be taught to stand more loosely and less set on his feet, and to watch the ball more carefully; and for this, of course, there is far more time. He must be careful how he hits, for there are fieldsmen out deep, and, if the ball is "skied," he may be caught.

Fielding. A boy who is slow in his movements should field at *mid-on* or *short leg*, or even *point* ; but his faults will not be so much noticed if he can hold a catch and stop what comes within his reach. Put your fast runner and long thrower deep in the country, and tell your captain to be careful to find a *wicket-keeper* and *short slip*, for these are the most important places in the field. Give the eleven all the practice you can, for, in these days of large scoring, fielding is more important than it was fifty years ago, and the terrible results that ensue from a dropped catch are painful to contemplate. Impress upon every boy the absolute importance of giving

the closest attention to the game, to every ball, for you never know when the catch or ball to stop may come.

Cricket and Character. Cricket is a grand discipline for character, though not quite so good as football. There is more room for the selfish player than at football or rowing; but, for all that, the spirit of comradeship is always present in all successful cricket elevens, and a wise coach will always impress this on all his pupils. The selfish cricketer is one who takes all pains while he is batting or bowling, but too often is slack in the field; and, moreover, he shows by many signs that when not batting or bowling he takes no interest in the game. One selfish player makes another, and gradually the whole side many become a bundle of loose sticks—all out on their own, but with no cohesion and little *esprit de corps*. Much depends on the captain, who ought not to hesitate to take strong measures to bring about a better state of things. He should put the selfish bat down the list, say, seventh or eighth, instead of first wicket down, and not begin the bowling with the selfish bowler; or, better still, suspend him from the eleven altogether for two or three matches. This is a very drastic step, and should not be adopted except for a very sufficient reason; but it may in the long run answer, and, if it does, will not only cause the whole side to be more efficient, but will make a good citizen of the boy in future years.

Temper is another quality which needs strong self-control, and this is essential in the case of bowlers. It requires a man of character to keep his temper as a bowler more than in any other department, particularly in these days of perfect wickets and long scoring. You are bowling your best, and the crack batsman against you is getting set when he sends an easy chance, and the fieldsman drops the catch. If a bowler can keep his temper under these circumstances, he must either be blessed by Providence, or have acquired self-control to a wonderful degree. Another trying time is when the ball beats the batsman but misses the wicket by a hair's-breadth; the luck that pursues some batsmen on occasions when the ball is badly hit up in the air but never goes to hand, and a bad fielding side when balls are "fumbled" and thrown to the wicket anyhow. But a hot or sulky-tempered cricketer is never a first-rate man on a side; and if a boy so disposed conquers himself, he will find out how, through the medium of a game, he has made himself a man.

R. H. L.

CRICKET FOR GIRLS.—Cricket is the most difficult game for girls to learn to play, and requires endless patience and perseverance, as well as thought and concentration. It is essentially a nervous game, owing to the individual character of its play—batting, bowling, and fielding depending entirely upon the individual players. Nor can a team always rely upon its best players to take the wickets or to make a score; this responsibility often falls upon its less able members. The success of the game depends upon the play of every girl upon the field. The captain should in all games be one in whom the girls have confidence, and, especially in cricket, should be one with sound judgment and quickness of perception, as the change of bowlers and placing of the field are of the utmost importance. Cricket more than any other game teaches *esprit de corps* and self-reliance, and develops what are known as the "sporting instincts."

Fielding. This is the one department of the game in which it is possible for every girl to reach at least an average standard. A good fielder will keep her eye on the ball from the time it leaves the bowler's hand until it is a "dead" ball. She stands with her weight on her toes ready to start immediately to place herself in the direct line in which the ball is travelling. The picking up and "throwing in" of the ball is all one action. Far too little importance is usually attached to the accurate throwing in of the ball at the wicket. The fielder should aim at hitting the top of the wicket, so throwing the ball that it will bounce once before reaching the wicket. Meanwhile, the wicket-keeper has so placed herself that the wicket is between herself and this fielder. She stands with her eye on the level of the top of the wicket, ready to put it down with the ball.

Bowling. It is necessary to have good bowlers before even an average standard of batting can be reached. Practising nets are a great advantage for practising bowling as well as batting, as they help to guide the direction of the ball. The bowler should first learn to get the right direction for the ball (in over-arm bowling using the left arm and shoulder to guide her). Next she practises the length; the distance from the wicket at which the ball should land varies according to the pace at which the ball is delivered. Having mastered the direction and length, the player can then turn her attention to varying her pace, and to practising the various breaks which can be given to the ball by a twist of the fingers. She should learn from the first to hold the ball in the fingers and not in the palm of the hand. Most girls, if they start young, find that over-arm bowling comes as easily to them as under-arm. However, it is very useful to have one or two under-arm bowlers in a team, so as to vary the bowling.

Batting. The batsman should take up as easy a position as possible, observing at the same time a few general rules. The left shoulder and elbow should point towards the bowler, and the head should be turned so that the bowler's action can be carefully watched with both eyes. The weight should be more on the right foot than the left, the feet being slightly apart; the block is just behind the right foot, and in front of the middle stump. The bat should be held near the top of the handle, the back of the left hand facing the bowler, the left elbow well forward, the bat itself sloping slightly backwards. Before the stroke, the bat is lifted behind in a straight line with the middle stump. The batsman steps with the left foot in the direction in which she wishes to hit the ball, unless the ball has a long pitch, in which case she must "play back" or "cut" the ball. Should she fail to play with a straight bat, she is in danger of sending a catch and so being "caught out." The girl must quickly decide how she is going to play the ball and play it with determination, hitting it hard. For further instruction, players are recommended to read one of the books written by famous cricketers (e.g. P. F. Warner). Nothing is more illuminating to an average player than to watch first-class cricket, county cricket giving a good opportunity for this.

P. L.

CRIMINALITY IN JUVENILES.—The extent of juvenile crime in England and Wales may be gathered from the volume of Criminal Statistics for 1914 issued by the Home Office. Much space

in it is devoted to the records of juvenile police courts, to which children between the ages of seven and fourteen, and young persons between fourteen and sixteen, must be brought when it becomes necessary for the law to deal with them. During the year, 14,845 youthful delinquents were charged with indictable offences, of which 13,000 were larcenies or some other form of dishonesty. That many of the offences were of a serious character is evident from the sentences imposed: for 821 children under the age of fourteen years were committed to industrial schools; and 1,065 others, all under sixteen, were committed to reformatory schools: industrial schools having power of detention until the age of sixteen, and reformatory schools until the age of nineteen. In addition to these commitments, 2,225 under the age of fourteen were whipped, 1,460 fined, 3,616 placed under probation officers, and 1,652 under recognizances of friends; 22 only were sentenced to terms of imprisonment. As the law does not allow children under fourteen to be imprisoned, it is evident that those imprisoned were over fourteen but under sixteen years of age. Further, 22,084 others were charged with non-indictable offences, many of which may be considered criminal or quasi-criminal (*e.g.* 1,500 were charged with stealing plants, fruit, etc.; and 5,000 others with wilful damage to property). Combining indictable and non-indictable offences, no less than 36,929 children and young persons were proceeded against in the Courts of Summary Jurisdiction that deal only with youthful offenders. This total included 19,194 boys and 986 girls under fourteen, and 13,724 boys and 688 girls under the age of sixteen; but these figures did not include all youthful offenders, for 734 other children and 2,544 young persons were dealt with in ordinary police courts, being charged jointly with offenders above the age of sixteen. Though these figures relate to the year 1914, they may be taken as fairly representing the normal extent of juvenile criminality. They also show that dishonesty is the commonest feature of juvenile crime.

The Offenders. Having shown the extent and character of the evil, it will be wise to consider some characteristics of the offenders. Here a much greater difficulty is met with, for, while official statistics furnish the numbers of offenders and particularize the offences, they give no particulars concerning the physical and mental characteristics of the delinquents. Yet such knowledge is essential if juvenile criminality is to be successfully dealt with. The present writer had for many years unique opportunities of estimating and tabulating the chief causes that lead to juvenile criminality, and of learning much about the personal characteristics of youthful offenders. This knowledge, combined with official information, has made it apparent that physical and mental inferiority is unmistakably the one great cause of juvenile depravity. Industrial and reformatory schools, with certain exceptions, receive for training only those boys and girls certified by medical officers as sound in mind and body (the afflicted being rejected as "unfit for training"); and their records show that the boys and girls thus trained are of inferior stature and weight compared with the ordinary children of similar age. Local prisons bear the same testimony, but more emphatically; and convict prisons give unmistakable evidence that physical and mental inferiority are the leading characteristics of prisoners sentenced to penal servitude. In this respect, the

child is father to the man. For nearly ten years the medical officers of a large London prison, instructed by the Prison Commissioners, conducted a strict examination of all the youthful prisoners who passed through that particular prison. Many thousands were thus examined, and in the words of the Prison Commissioners: "The youthful offenders who passed through Pentonville Prison were two inches shorter and fourteen lb. lighter than the average height and weight of the industrial population of similar age"; and "28 per cent. suffered from physical disease or deprivation." The Commissioners also add that "they furnish the highest percentage of re-convictions, no less than 40 per cent. being recorded." That such young offenders continue their criminal habits is also established by a great medical examination of convicts which occupied eight years. Three thousand convicts were placed under strict examination, the highest authorities in science assisted, everything that could be noted was tabulated, and ninety questions fully answered about each convict; but the only dominant fact revealed was that the convicts were much inferior to the average population in height, weight, health, and intelligence.

Defectives. Here, then, running through the three stages of school, prison, and penal establishment, the connection between crime and physical and mental inferiority is clearly established. This connection should be remembered by the State and the various semi-philanthropic agencies authorized to deal with, educate, and train youthful offenders. It is a strange and deplorable fact that the State and reformatory agencies provide few institutions to which defective children charged with criminality, can be admitted. Magistrates, whether at juvenile courts or ordinary police courts, have no power of committal, though they may realize the absolute necessity of detention and training for many young offenders whose home life is of the worst possible description. They may order such offenders to be whipped or fined, and, when old enough, they may commit them to prison. Magistrates know that such sentences will be duly carried out; but no magistrate, judge, or even a higher authority, can compel any reformatory school to receive a youthful delinquent unless the doctor approves and the managers consent. Further, should any young offender, after passing the medical examination, be found to suffer from mental or physical afflictions, he or she may, with the consent of the Home Secretary, be discharged from the institution as "unfit for training." It may be asked, what becomes of these unfortunates, and the answer is simple. They are returned to their homes and there qualify in due time for prison. This procedure is not only disastrous, but unjust, as the following will show: Several boys are frequently charged jointly and proved equally guilty, when the custom at all police courts is to remand them for a week that industrial schools may be found willing to receive them. During their remand, they are all medically examined and the healthy boys are accepted, and, after a word of encouragement from the magistrate, are taken to a school to be educated and trained. Towards this training, however, the State makes a weekly capitation grant, which the local authorities supplement, and from these two sources the industrial and reformatory schools receive nearly the whole of their financial support. The doctor may discover

that one of the boys is lame, suffers from fits, has a weak heart or is weak-minded, so this suffering offender, because of his helplessness, is either punished or discharged, as the magistrate directs. A diseased or deformed body, especially among the poor, is often indicative of a perverted mind; and, as with age the afflicted young offender's habits grow fixed and permanent, he ultimately becomes that most hopeless of human problems—an afflicted prison *habitué*. There are, of course, other causes of juvenile criminality easy to deal with; but no other is so productive as the State's neglect to train and educate youthful offenders suffering from mental or physical afflictions. To whip a boy suffering from epilepsy or some other kind of fit is to commit a crime; while to send him home, there to be a terror to his parents and a danger to the neighbours, is neither wise nor just. To subsidize philanthropic bodies fully, and then allow them to select the healthiest and best children only, is not good statesmanship. For all these things, the country has to suffer, and will continue to suffer until sufficient humane and just provision is made for educating and caring for the growing number of afflicted juveniles possessed of criminal habits.

T. H.

CRIPPLED BOYS, THE NATIONAL INDUSTRIAL HOME FOR.—This was established in 1866 under the presidency of the first Earl of Shaftesbury, who gave hearty support to the institution and its aims. It receives crippled boys who are destitute, neglected, or ill-used, between the ages of 13½ and 17 years; and maintains them for three years, providing board, clothing, education, and industrial training.

A payment of £15 per annum in advance is required for the full term of three years. Those who become responsible for the annual payment become patrons. A donation of 200 guineas constitutes a life governor, who is entitled to have a crippled boy in the home from time to time provided there is a vacancy. Candidates are admitted in rotation, and votes are not required in any case. Boys are not admitted if they are suffering from other physical defects besides being crippled, nor if of bad character; and each is medically examined before admission.

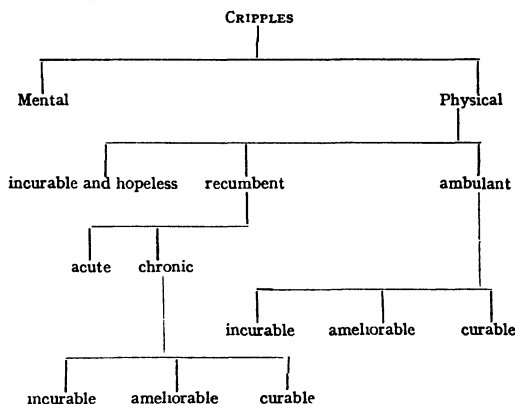
The number of boys in the institution is about ninety, of whom one-third pass out annually.

The industrial work includes tailoring, boot-making, die-stamping, copper-plate printing, harness-making, and carpentry. Tailoring and boot-making occupy the largest numbers; and among boys who have left the school, several have been able to establish themselves in their own businesses as bootmakers or tailors, while the majority who leave are able easily to obtain regular employment. The curative effect of the treatment of cripples is shown by the fact that one boy who entered on crutches in 1913 was accepted by the Army in November, 1914; and four others who had left since 1907 were found to be serving in either the Army or the Navy. The Home is at Woolthorpe House, Wright's Lane, Kensington, London, W.8.

CRIPPLED CHILDREN.—The social and educational problem presented by the crippled child is one of extreme interest, but of extraordinary complexity and difficulty.

Definition and Classification. What is a crippled child? The popular conception is probably that of

a deformed child. A better definition, which would afford a reasonable and reliable basis from which to work, might be obtained by describing a crippled child as one who exhibits such a permanent but definite mental or physical deviation from the normal as to require special medical and educational treatment. Such treatment calls for the co-operation of both doctor and teacher, and, where possible, their simultaneous co-operation. If we adopt the definition just propounded, the necessity arises for some such classification as the following—



Regarded logically, it is curious that the mentally defective child, whose classification is not here attempted, has received, and is receiving, far more care educationally than the physically defective. To some extent, this is the natural outcome of the necessity of segregating such afflicted children. Indeed, for many of these, educational treatment affords the greatest and, perhaps, the only hope of amelioration. The value of such treatment is strikingly illustrated by examining the admirable work and training done at such institutions as the Imbecile Asylum at Darenth. However, the benefit that has accrued to these unfortunates is not altogether the result of a wise desire to ameliorate their lot, but rather as the outcome of the imperative need for their segregation. With physical cripples, such need of segregation is not so apparent. Hence, till recently, little, if anything, had been done by those in authority for such sufferers, and their care has devolved largely on a kindly, but too often indiscriminating and ill-directed, charity. While, then, we may accuse the community (*i.e.* the Government and those public bodies on whom such duties devolve) of having largely neglected the educational, and even the medical, care of physically defective cripples, we may hardly condemn. The requisite expenditure must first be conclusively proved justifiable. It is easily demonstrable that wise legislation would ensure medical care of, and suitable educational facilities to, the crippled child; and also be non-speculative and highly remunerative.

Treatment. It will be observed that we divided the physical cripples into three main classes, according to their condition and the possibility of dealing therewith. The first class includes those cases affording little chance of recovery (*e.g.* sufferers from pseudo-hypertrophic muscular paralysis, very bad septic or amyloid cases of surgical

tuberculosis, hopeless heart cases, etc.). For these, earnest educational endeavour would be out of place; but their end may be made brighter and happier by simple manual instruction, and such may be regarded as the truest and highest form of charity—a gift in return for which no tangible result can be received. From the other cripples more may be expected, and to these more should be given. We would divide these into (a) those who remain bedridden or who should be treated in bed, and (b) those able to walk about safely. The former of these need care in a hospital school; the latter need similar care, but may generally be satisfactorily dealt with in a special school for the physically defective. Those recumbent cases acutely ill seldom remain long thus, and they, as a rule, may be speedily transferred to the type of chronic recumbent cripple who can well avail himself of, and benefit by, suitable instruction. As our experience at Alton has shown, such may usefully be educated without the medical treatment needed being interfered with in the slightest. These need specialized instruction suited and adapted to their condition and environment. It is essential that the teachers should be skilled in their art, sympathetic and trained to hospital work. Those cripples who are curable will be drafted, as their condition permits, into ordinary schools, and may have gained rather than lost during their enforced absence.

For those cripples whose condition is incurable or which can only be ameliorated, further special, but not unduly costly, provision will usually be called for. Such, when ambulant, may continue their education in the existing special schools. They always require sympathetic and skilled "after-care," though the great danger to these children is that they will lose invaluable guidance when in charge of members of a great organization dealing with masses rather than individuals. This danger has been avoided at Alton, for discharged patients are encouraged to report regularly at our Out-Patients' Department in London, where they can avail themselves of just that sympathetic guidance which they, and their guardians, so urgently need.

There remains, then, the adolescent cripple who continues to remain permanently so disabled that subsequent special technical instruction is needed if he is to earn his own livelihood. His physical limitations prevent him from successfully competing with his fellows. The remedy lies in facilities for technical training in some trade. This can be most efficiently provided if he is resident in a properly organized and equipped institution, which affords, at the same time, greater choice of occupation and combines the healthy moral effect of a well-disciplined school. For such, at Alton, exists the College, where suitable trades are efficiently taught, enabling crippled boys to be self-respecting and self-supporting. Is it too much to hope that the Cripples' Hospital and College will prove to be the model for a universal system, which will confer the opportunity on every cripple child in the kingdom of obtaining, either a cure, or the opportunity of earning his own livelihood in some occupation, for which he may become well fitted, and which is suited to his limitations? W. P. T.

Reference—

"Medical Report of the Lord Mayor Treloar Cripples' Hospital and College, Alton, Hants."

CRITICISM LESSONS.—These are associated with the training of teachers. They are examples of how a thing should be done or not done, as the case may be. They are usually associated with the training college, but are also a vehicle of instruction to pupil-teachers and student-teachers in the art and practice of class-management and the giving of lessons. In many ways example is better than precept: an excellent knowledge of the principles of education is by no means identical with professional skill in the schoolroom. To become a reasonably good teacher the student-in-training must teach; and this by way of a good deal of regular and continuous practice for the sake of progressive facility and skill. But the thought is that he shall observe others also: the best models for the best effect, but those also of a lower level of merit as typical of pedagogic defect or shortcoming. Thus at one time he will teach and at another criticize; and an exercise in which one gives a class-lesson, and others observe, judge and comment, is known as a "criticism lesson." Its value depends upon thoughtful preparation on the one hand and judicious expression of opinion on the other. It is apt, however, to become artificial and, in a way, solitary: it is upon a special subject, given in special circumstances and conditions to a special class. But there is probably nothing that can focus so well the teachings of the "master of method," or so clearly illuminate the relation between educational theory and scholastic practice. It is probably at its highest of good result in the procedure of the training college when the teacher is able and intelligent, the number of observing students not very large, the subject in the ordinary routine of school-work and the class normal, the critics disposed both to praise and blame, and the lesson and its manifold opportunities "pointed" by expert members of the college staff.

In this connection it should be noted that, in their Regulations for the Training of Teachers for Elementary Schools, the Board of Education expect "that systematic provision will be made for enabling students to see work being done by teachers of special competence and experience, who will explain the procedure followed and discuss it with the students. The teachers of special subjects in the training colleges should, as a rule, be qualified to take an active part in this kind of work, and should share in the conduct of technical exercises. 'Criticism,' or 'Open' Lessons, should, as a rule, be conducted with small groups of students, but opportunity should be found for some such exercises to be seen by the greater part of the staff together, in order to secure agreement as to aim and procedure." A. E. L.

CROCHET WORK.—(See KNITTING AND CROCHET, THE TEACHING OF. NEEDLEWORK, THE TEACHING OF.)

CROKE (or CROCUS), RICHARD.—A Greek scholar of the time of Henry VIII and the two following reigns. He was educated at Eton and Oxford, and studied Greek under Grocyn. Under the patronage of Archbishop Warham, he studied at Paris University; and afterwards lectured to crowded and enthusiastic classes on Greek at Louvain, Cologne, and Leipzig Universities. His works on Greek literature gained him a wide reputation. In 1517, he became Greek lecturer at Cambridge, where he remained in spite of the

attempts of Warham, More, Grocyn, and Linacre to induce him to settle at Oxford. In 1529, Cramer sent Croke to Italy to collect the opinions of Italian authorities upon the king's divorce, and Croke reported favourably. He preached many sermons in favour of the King's supremacy, but received little reward. He died in 1588.

CROSBY, MERCHANT TAYLORS' SCHOOL.—(See LONDON CITY COMPANIES AND EDUCATION, THE.)

CROSS COMMISSION, THE.—The Elementary Education Act of 1870 (with Acts following in 1873, 1876, and 1880, amending or complementary), had influenced profoundly the primary schools of the country. In the towns—and in the large towns especially—the Board Schools had become exceedingly successful and popular, and their success and popularity had extended upwards: the numbers of children in attendance were not any greater year by year, but the children themselves were often drawn from a higher social class than could have been contemplated in 1870. With the financial opportunity of the rates, the schools were usually staffed and equipped more generously than could be expected in the case of voluntary schools; and in the race towards scholastic excellence it was clear that the system which was poorer in money resources must be outstripped. A rising standard of efficiency increased the difficulties of the position, and denominationalists began to feel an "intolerable strain." They wanted more money, and wanted it badly.

In 1886, a Royal Commission was appointed to inquire into "elementary education in England and Wales." The chairman was Sir R. A. Cross. Among other members were the Earl of Harrowby, Dr. Temple (Bishop of London), Cardinal Manning, Mr. A. J. Mundella, Sir John Lubbock, and Sir Francis Sandford. Their first report was issued in September of the same year, and their final report in 1888; the conclusions and recommendations of the majority appearing in June, and those of a powerful minority in July. At once was seen the usual sharp line of division between public control and the existing dual system; and, in November, the Government definitely declined to interfere with the settlement of 1870. The report of the majority pointed plainly to the solution of the education question as a whole which was adopted by the Act of 1902, and definitely recommended that aid should be given from the rates to voluntary schools, without the limitation of "Cowper-Temple" religious teaching. But legislation on the large scale was hardly opportune. County Councils were being brought into existence under the Local Government Act of 1888, and would have enough to do for a time without additional responsibilities in the administration of elementary education. Yet more or less immediately connected with the labours of the Commission, or arising therefrom, were the Technical Instruction Acts of 1889 and 1891, the Free Education Act of 1891, and the Voluntary Schools Act of 1897: this last was "an Act to provide for a Grant out of the Exchequer in Aid of Voluntary Elementary Schools, and for the Exemption from Rates of those Schools."

A. E. L.

CROWD, THE PSYCHOLOGY OF THE.—(See CLASS, THE PSYCHOLOGY OF THE)

CRUELTY TO CHILDREN ACT, 1904. PREVENTION OF.—(See LAWS AFFECTING CHILDREN, THE.)

CUBA, EDUCATION IN.—Under Spanish rule, elementary education was first undertaken by private enterprise in the eighteenth century. About the same time a Jesuit College was opened in Havana for higher education, and in 1728 a Dominican University was founded there. At the end of the century the Governor (Las Casas) was instrumental in founding the Economic Society of Havana, which took steps to improve education in the island, opened a number of free schools, and provided funds for the promotion of higher learning. The Cuban schools received but little support from the Spanish Government until 1863, when an organization of education was attempted; and primary, secondary, and higher schools were modelled on those of Spain. The revolutionary struggle after 1867 hindered the progress of education until, in 1899, the American military governor took over its administration. He issued regulations in 1900 providing a Commission of Public Schools, and a board of superintendents for each province of the island. Instruction was made compulsory for all children from 6 to 14 years of age, and all teachers were compelled to attend teachers' institutes provided in every province. The effect of these regulations was to increase greatly the school attendance and the number of schools. The people of Cuba assumed the government of the island in 1902, and the present system of education was established in 1909. Many improvements have been made in grading schools, and in the introduction of useful branches of handwork. The training of teachers is receiving careful attention, and a system of high schools has been provided. A number of teachers of English are employed in the public schools. The high schools prepare students for degree examinations of the University of Havana. The State is contributing increasing sums to the support of the high schools, teachers' institutes, and the School of Arts and Trades at Havana.

CUDDESDON COLLEGE.—(See CLERGY OF THE CHURCH OF ENGLAND, THE TRAINING OF.)

CULHAM TRAINING COLLEGE.—This was founded by the aid of Samuel Wilberforce, Bishop of Oxford, for the training of Church Schoolmasters: and was opened in 1852. It provided students' apartments, hall, chapel, and principal's house. A middle class school was attached for use as a practising school. Many additions were made in 1902, including a recreation-room, a science theatre, and a laboratory. The College has also a good library a gymnasium, and bath-rooms, and is lighted by electric light. Accommodation is provided for ninety resident students, who are admitted on the result of any examination accepted by the Board of Education. The College is under the management of a diocesan committee (including the Bishops of Oxford and Reading, and the archdeacons of the diocese), and the students generally belong to the Church of England; but Nonconformists are admitted subject to the regulations of the Board of Education. A fund is provided by the Oxford Diocesan Board to assist students coming from schools in the diocese. The College has long provided a company to the Oxford and Bucks Light Infantry. Students of Culham have taken many honourable places in the educational world

and elsewhere, and among a very large number may be mentioned Professor Lapworth, of Birmingham University; Prebendary Corfield, Principal of Brighton Training College; Canon Fairchild, Principal of North Wales Training College; Lieut.-Col. Chapman, V.D.; and the Ven. Archdeacon Noakes, of Derby.

CULTURE IN ITS RELATION TO EDUCATION.

—Culture is the embodiment in the mind and life of a people of all that it has achieved in thought, character and manners, enriched by the associations of a common history and literature and of a common land. It is at once a possession, for it sums up all that has been attained in the past; and a spirit, because it is not merely a stock of knowledge, but an attitude of mind, a way of looking at the world.

Where are we to find the culture of a people? In the minds and lives of its best men and women, and from them permeating the whole society. If it is "the knowledge of the best that has been thought and said in the world," it is something more; it is a knowledge absorbed and made one with the mind and being of its possessors, and strengthened by countless associations of a common life and common ideals. It is human and vital, issuing not merely in production or action, but in national life and character. It can only survive if in each generation fresh minds are educated to carry it on; it lives no charmed life, it must be continually refreshed and born anew.

Culture, then, stands in closest relation to the nation's life, for every man must live his life for and among his own people, through them enriching, if he has it in him, the culture and wisdom of the world. It is national; but in science, literature, and the arts the nations find common ground. Each nation must have its own culture, for only so can it make the best of its powers, but it must take account of the culture of other nations, or it will be provincial and incomplete.

The Aim of Education. When we ask where we are to find this impalpable essence of a nation's life, we are face to face with urgent problems of education. From Plato onwards, selection has been recognized as one principle in education; capacities are unequal, and some minds are less capable than others of the highest reach of knowledge or feeling. A nation is a complete whole, in which many persons and classes share in producing and enjoying the national resources, material and spiritual: the hand worker needs a different education from the clerk; the scholar, the man of science, the artist, and the man of affairs need a longer and fuller education than either of these. In what relation do education as a necessity for all, and education of the higher kind, stand to culture? Two principles must be laid down: First, that to judge the culture of a people we must look both at its best products and at its spirit as a whole; secondly, that the culture of the highly educated must not be isolated from that of the mass of the people. The best minds in all classes among the young must be selected and given access to the highest education, and not only so, but some access to this education must be open at a later stage to the men of all classes who desire it and will make sacrifices to attain it. When we speak of education in relation to culture, we think mainly of higher education, but always with the assumption that it is accessible in some measure to all; and that a large element in culture, the pride

in traditions and in a land and landscape that appeal to men through a thousand different channels, may be freely shared by all. The education which is to produce true culture must introduce men to all the main departments of knowledge; it must open up the world of literature, science, art, and philosophy; it must provide training in historical method and lay the foundation for professional studies—law, medicine, engineering, architecture. Even in its elementary form, education must not only provide the bare necessities of knowledge for all children, but also by simple religious teaching, given within or without the school, and by education in character, as well as by some physical training and elementary discipline of hand and eye, fit them to become loyal, capable, and intelligent citizens. What particular form the higher education takes must depend on individual aptitudes, but for every one it must include some knowledge of "the humanities" (history, literature, and philosophy), and of the main ideas and principles of natural science, together with some training in the understanding of the great achievements of art.

Education an Organic Whole. But education cannot be shut up in water-tight compartments. It is a question of national economy what proportion of its members a nation can afford to educate in the higher range of studies; but one governing principle is indispensable: the education of a country must be an organic whole, all the members of which feel that they share in their degree in the movement of the spiritual forces which constitute the nation's culture. The people at large will get their stimulus from many teachers, living and dead, and from the instinctive feelings of freedom and justice which have been wrought into the fibre of the nation. It is the special function of the universities to be the living centres of research and study, from which, through teachers quickened by contact with master minds and the best methods, the nation shall be stirred to the higher issues of life. But this organic unity cannot be achieved unless the waste in elementary education is abolished: by improved mechanical appliances, by better organization, by the sacrifice of immediate profit to a sounder social ideal, the years of elementary education must be prolonged and the hours of labour shortened. Only so can the nation at large enter into its inheritance and the schools fulfil their purpose.

Education is not a system but a living process, and its success rests on two indispensable conditions. There must be a body of well-educated teachers who are living ministers of the culture which has bred them, and there must be faith among all classes that education is worth having, and that only by self-discipline can a nation truly live its life. The teaching of schools and universities must be reinforced by the influences which spring from family affection and from the life of the Churches, penetrated by the Christian ideal, in which man's duty to make the best of himself and his own powers is ennobled by the desire of serving mankind and fulfilling the will of God. Music, drama, and the fine arts will enlarge and enrich the life of a nation in which all are recognized as sharing in a common culture. If these conditions are realized, then national education will achieve its perfect work by creating an atmosphere in which selfishness, ignorance, irreverence, and vulgarity will find it impossible to live. In such a nation, all the forces of education would work together without jealousy and without friction to realize a national ideal of

character and culture, which would command the respect and loyalty of its own people, and contribute out of an abundant and varied life to the spiritual wealth of the family of nations.

P. E. M.

CULTURE STAGES.—Herbart and his followers have always laid stress upon ideas and, therefore, upon instruction: "I have no conception of education without instruction." The teacher's function is to act as a middleman between the pupil and the race's vast mass of accumulated and accumulable knowledge. And though a critic may quite plausibly argue that the fundamental thing in educational psychology is *instinct*, the fact remains that instincts are plastic and dirigible; they can be guided in this direction or that by means of ideas. Further, some instincts are undoubtedly mischievous, and should be starved to death, if possible. But Herbart and his followers, while stressing ideas, have been too wise to ignore this inner Froebelian factor of instinct. Herbart himself studied instincts with great care, and wrote much about them; and his follower, Ziller, achieved a great, though now almost forgotten, popularity by effecting an alliance between ideas, instincts, the doctrine of evolution, and the doctrine of concentration (see CONCENTRATION), in what is known as the "Culture Stages Theory."

Recognizing the fact (broadly true) that the child passes from conception to birth and from birth to maturity through various pre-human and pre-historic stages (the gill-clefts of the fish appear during the early embryonic weeks; hunting, nomadic, and other instincts during childhood), Ziller proposed as "concentration material" for the eight "school years": (1) Twelve of *Grimm's Fairy Tales*; (2) *Robinson Crusoe*; (3) *The Patriarchs*; (4) *The Judges*; (5) *The Kings*; (6) *The Life of Jesus*; (7) *The Apostles*; (8) *The Reformation*; together with, in the last six cases, secular history selected in a similar manner. His view was that this material corresponded psychologically to the growth stages of the child while in the primary school. Torrents of criticism have been poured over this scheme, but the root principle is sound enough (with the qualifications discussed under CORRELATION and CONCENTRATION). It must never be forgotten, however, that though the child's instincts may be in one "stage" (e.g. nomadic), he lives in the modern world—the "stage" of newspapers and aviation; thus the best laid scheme of culture stages cannot be rigidly adhered to. Further: the importance of an *ideal* of educational work is all-important; and the culture stages doctrine does not necessarily supply this.

F. H. H.

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CURRENT EVENTS, THE TEACHING OF.—

The usual scholastic method, when any at all is adopted, of teaching current events is to employ illustrative newspaper maps or pictures, and to make a few comments, perhaps followed by the writing of an essay upon those events. Such a method cannot be regarded as very worthy or dignified. Why teach current events at all? Because (see CORRELATION) there is an ever-present tendency to separate school work from life. No subject has suffered more from this than history, which, to many children, appears as a record of remote and fanciful events entering into no *nexus*

with the life of to-day. By abstracting material from the contemporary Press and by "educational visits" to historical buildings, something is done to counteract this tendency. Further, reality is introduced into history lessons if the references to current events are, so to speak, *negotiated*; that is to say, the teacher leads his class subtly forward to the point where a reference to the event of the moment is inevitable to the brighter pupils, who themselves volunteer the reference, which can then be amplified by the teacher. Two other suggestions seem called for.

Time Charts. It is almost futile to teach any events—current, modern, mediaeval, or ancient—without time charts permanently hung or painted on the walls. The "space-for-time" method of Hutchinson still continues, despite protest after protest by educationists, to be hardly employed at all. Yet the chief interest of an event is often its time relation—its place in a century or an epoch; and no child can think in centuries or epochs without a "space-for-time" *schema* in his mind. Luther, Raphael, and Rabelais were born in the same year; Shakespeare and Cervantes died in the same year and, as some have alleged, on the same day. These, to be sure, are mere coincidences; but they are also time relations, and are by no means to be despised. More important, however, are the great evolutions and nemeses of history, such as Merejkowsky has exploited in his three great novels. Without the presence of a time-chart such things cannot be placed: they stand out of "perspective." (See PERSPECTIVES, APPRECIATIONS, AND ATTITUDES.) This is also true of current events, unless, indeed, they are thoroughly trivial, in which case the school is hardly called upon to deal with them. Suppose, for example, a new invention is announced in the daily Press. The teacher who has a time-chart is able to indicate upon it, by a flag or a pin, the first appearance in history of the crude idea of the invention, and to trace something of its evolution. There is also the forward-looking aspect of a chart indicated by the blank centuries yet to come.

Another Suggestion. Lastly, the writer would emphasize his conviction that one of the greatest needs of the modern school is the creation of a morning (and, perhaps, afternoon) ritual or liturgy, replete with a noble suggestiveness as a result of its richness in musical, literary, and Biblical material. Assuming the existence of such a liturgy, a few minutes might be allotted during the course of it to references to current events, particularly if their significance could be established in the more general phraseology of the liturgy itself.

F. H. H.

CURRICULUM OF PRIMARY BOYS' SCHOOLS.—

The character of the aim of a school is a condition precedent to a satisfactory choice of the materials of instruction, and most teachers will agree that this aim in elementary schools should be directed towards a *general* rather than a *specific* education.

What Things are Most Worth Knowing? It is obvious that some kinds of knowledge are more useful than others for a general education; but, unfortunately, there has never been among the most distinguished writers on education any real agreement as to a standard of relative values concerning the various subjects; and, until this standard has been determined, the relative worth of any

given material must be either settled empirically, or accepted provisionally in the light of more recent discussion and of psychological investigation and experiment. Practically all the great educational reformers have advocated a close relationship between school activities and life itself. Like the actor, the school to be truly effective must, as a primary condition, hold up the mirror to Nature: and this identity with life's actualities should also be the ultimate test in determining what particular subject should be taught and how the curriculum should be constituted.

Spencer (*Education*) enumerates five classes of activities of life in the order of their relative importance, and adds that: "The ideal of education is complete preparation in all these divisions; but, failing this ideal, the aim should be to maintain a due proportion between the degrees of preparation in each."

Life may, however, be considered, in the first instance, in two phases only, viz., of *livelihood* and *leisure*—

- | | | |
|---------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------|
| 1. <i>Livelihood includes</i>
(utilitarian) | { | Industrial activities
Commercial "
Professional "
(Applied Arts and
Sciences, etc.) |
| 2. <i>Leisure includes</i>
(social & cultural) | { | Literary activities
The Arts and Sciences
Games
Other activities, known
generally as "hobbies." |

Further Considerations. The way is now prepared for certain other important considerations—

1. **MATERIALS OF INSTRUCTION.** We must endeavour to extract from these certain values which will appropriately correspond, in all their elementary and typical features, to the main activities of life already indicated. Now, the subjects of a curriculum may be selected for their values on one or more of these grounds, viz.—

- (a) a mental gymnastic;
- (b) the concepts and ideals derived from them;
- (c) the intrinsic value of the material.

As criteria of ultimate value, all these have been operative in varying degrees, the primary school, without doubt, being the least affected by (a) and (b), which represent, in the main, the doctrine known as "Formal Training."

However, the present writer, so far as primary schools are concerned, is on the side of those who advocate intrinsic value as the final test for the choice of curricula, without conceding the point that the disciplinary value of a subject is a negligible quality in all cases.

2. **INFLUENCE OF ENVIRONMENT.** Environment is necessarily the starting point of life's experiences—the beginnings of education. To select suitable material at hand rather than that which is remote is obviously right, for environment is a finger-post to the educational law that the *empirical* should precede the rational; and, consequently, every child should have his own experimental introduction to every subject of instruction.

3. **CORRELATION.** The grouping of subjects on a rational basis is also an important matter. The principle of correlation has been so much outraged in some schools that it has become a useless bore to the scholars. Its utility lies in moderation and in the association of materials or activities that are naturally related.

4. **SIMPLICITY.** There is no doubt that some practical teachers and educational theorists have much overestimated the child's powers for abstract thought. For though children, especially boys, take a delight in a thing as a whole, they can only apprehend its parts in a fragmentary way. Their acquirement of complex knowledge must necessarily be slow, like their mental development. Indeed, there must necessarily be, too, a complete correspondence between the progress of brain-architecture, and the ability to assimilate the concepts and ideals of varying difficulty. It is desirable, therefore, that the materials of instruction should be simple and delicately graded, for expectations will only be realized if it is assumed that even the older primary scholars are not able fully to grasp the meanings and applications of those great uplifting ideals which have promoted racial development, and are mostly within the mental range of a well-educated adult; for children's mental habits are generally narrow and specific, their mental life not being generalized, and chiefly, therefore, concrete. Yet probably the best symbol for a child's mind is a note of interrogation. This instinctive curiosity must be provided for by a liberal course of instruction, though necessarily comparatively superficial.

Guiding Principles. From this brief discussion, there emerge principles which should be applied to the choice of primary curricula, viz.—

1. The subject-matter should be representative of life's chief activities and of natural phenomena. The materials, therefore, should be so selected as to illustrate the most characteristic fields of enterprise in our national life.

2. The intrinsic value of the materials should be the predominant criterion in selection.

3. The materials which bear directly on environment should have preference. A knowledge of environment must be the best foundation of education.

4. The content of the materials should be simple, but wide and quite within the range of the pupils' acquirement. The content must be graded to meet the needs of the different stages of mental development represented by the various classes.

5. The aim being *general*, a due proportion must be observed between the claims of the various parts of the curriculum, in order to secure balance. The *utilitarian* subjects should stand in the first rank, being simple in principle and wide in value; the *social*, next; and the *cultural*, last.

The curriculum being settled, the subjects should be grouped in accordance with their natural affinities, i.e. *organized* to produce the best possible results.

Specimen Curricula. It follows, in accepting Spencer's views of the function of education, that a school has to educate the child as a child, and thus prepare the way for "complete living" later. Upon the character of the child's education will largely depend the attainment of complete living by the adult, and herein will be found probably the best reason for identifying the school with adult ideals and activities. The chief essentials for complete living are—

1. The widest and deepest knowledge of facts, concepts, and ideals, and their relations to each other and to the laws of life.

2. Certain highly-skilled executive powers.

3. An active appreciation of the noble and the beautiful.



Morris Dance—Little John, Jack o' the Green, and Will Scarlet



The Peasants' Dance—Crowning the Queen

PLATE XXVII

The school, therefore, as a preparatory ground for these three phases of life (*i.e.* utilitarian, social, and cultural) must identify itself with them, and determine its work and curriculum accordingly. Subjects of instruction may be thus roughly allocated under the three headings in question—

UTILITARIAN. Speech (including Phonetics); Reading; Writing (mechanical); Composition; Arithmetic; Physical Exercises (including Games); Applied Arts and Sciences (including Drawing, Modelling, and Hygiene); Handwork (Paper and Cardboard, etc.); Handicraft; Bible Instruction; Music (singing) [vocal music is partially utilitarian, since it promotes development of lungs and vocal organs, lends easy refinements to the voice, and is a valuable aid to speech-training]; Spelling; Grammar; History; Geography (social and physical).

SOCIAL. Standard English Speech; Composition; Games; Arts, and Social and Political Science; Biblical teachings; Music; History and Geography (social).

CULTURAL. Literature (including the Bible); Composition (literary); Mathematics; Physical Culture; Arts and Sciences; Music; History; Nature Study; Horticulture.

It will be seen that the foregoing shows considerable overlapping, some subjects, like the Arts and Sciences, and History, having the three values. Again, Music could be included under Arts, except for the necessity of specifically naming it. Spelling, Grammar, History, and Geography may be regarded as indirectly utilitarian. Except Nature Study, Horticulture, and Physical Geography, all the above subjects may be classified as *humanistic* studies or activities as opposed to *naturalistic* studies. It will be convenient to adopt that heading as the dominant one in a cross classification in which the subjects of instruction will appear in three divisions in connection with the suggested apportionment of the approximate time per week. In this connection, it is recommended that the primary school be divided into two parts—lower (7 to 11 years) and upper (11 to 14 years). This recommendation is made, first, because the younger pupils should not, as a rule, have lessons which exceed thirty minutes in duration, whereas the older scholars might profitably have longer lessons; and, secondly, the *content* of the materials of instruction (*inter alia*) should show great variation between these two classes of scholars.

Lower Division of the School. HUMANISTIC SUBJECTS. 1. *English.* Phonetics, 40 min.; Reading (formal), 3 hrs. [chiefly *oral* in the lower classes of this division]; Writing (mechanical), 1 hr. 30 min.; Spelling and Dictation, 1 hr. 20 min.; Composition (oral and written), 2 hrs. [two hours might well suffice for formal reading when the child has reached 10 years of age, and the one hour thus available be used in other ways]; Literature (with Recitation), 2 hrs. Total, 10 hrs. 30 min.

2. *Other Subjects.* Bible Instruction, 2 hrs. 30 min.; History and Geography (social), 1 hr. 30 min.; Singing, 1 hr.; Drawing and Modelling, 1 hr. 30 min. Total, 6 hrs. 30 min. Total for 1 and 2, 17 hrs.

NATURE STUDY AND SCIENCE. Geography (physical), 1 hr.; Nature Study or Elementary Science, 1 hr. 20 min.; Arithmetic, 3 hrs. Total, 5 hrs. 20 min.

PHYSICAL AND MANUAL TRAINING. Physical Exercises (with Games), 1 hr. 45 min.; Recreation, 2 hrs. 5 min.; Handwork, Paper and Cardboard Modelling, etc., 1 hr. 20 min. Total, 5 hrs. 10 min.

Total time per week, 27½ hrs.

Upper Division of the School. HUMANISTIC SUBJECTS. 1. *English.* Reading (formal), 1 hr.; Spelling and Dictation, 1 hr.; Grammar,¹ 1 hr. 30 min.; Composition, 1 hr. 40 min.; Literature (with Recitation), 3 hrs. 30 min. Total, 8 hrs. 40 min.

2. *Other Subjects.* Bible Instruction, 2 hrs. 30 min. History and Geography, 2 hrs.; Singing, 1 hr.; Drawing, Painting, and Modelling, 2 hrs. Total, 7 hrs. 30 min. Total for 1 and 2, 16 hrs. 10 min.

SCIENCE. Practical Science (Elementary principles), 2 hrs.; Mathematics, 3 hrs. Total, 5 hrs.

PHYSICAL AND MANUAL TRAINING. Physical Exercises (with Games), 1 hr. 45 min.; Recreation, 2 hrs. 5 min.; Handicraft (Woodwork and Metalwork), 2 hrs. 30 min. Total, 6 hrs. 20 min.

Total time per week, 27½ hrs.

Relative Values. With reference to these summaries, the following points will be noted: The absence of formal Grammar in the *lower division* and of mechanical writing in the *upper*. If writing is efficiently taught and properly co-ordinated from class to class, the mechanics of this subject ought to be completely mastered by 11 years of age. After that age, facile penmanship, speed, and an attractive style, with easy legibility, should be the aim. The time suggested for Literature should also be carefully noted and considered. There is a literature for every one: nursery and other stimulating rhymes for the infants; fairy tales and other stories, illustrating the operation of eternal principles, for the younger children of the senior departments; and the simpler classics for the older scholars there. It is this literature which will help to implant those concepts and ideals that are to lead and illumine the way to "complete living"—for ideals are the forces with which the expansion of life is to be mainly effected in the future. The one hour allowed for formal Reading in the upper division might well be used for other purposes in the last year of the boy's school life. It might go, for example, to Literature, Science, or Mathematics, according to circumstances. Again, the one hour for Spelling and Dictation in the last year might be otherwise utilized. The child should be convinced, before facing the troubles of the labour world, that life is a wonderful and beautiful gift. Some of the time devoted to physical culture should be used in two-minute exercises between the lessons—such exercises to involve quick muscular movements, in order to stimulate the heart, and thus give increased activity to blood and lymph. Horticulture, a desirable subject crowded out, is, like music, a civilizing agent of great immediate value. Even if horticulture assumes the form of box-gardening, it should receive more encouragement, especially in poor areas. Actual school gardening can, moreover, be fruitfully extended by supplying seeds and plants for home cultivation; the resultant plants to be exhibited at the school, when prizes and certificates can be awarded.

In the application of the curriculum, the school must recognize that other agencies are endeavouring to translate individual potentialities into active powers, and should, therefore, co-ordinate its efforts with them. Habit-building, character formation, and some understanding of individual ideals cannot be a part of the curriculum, though it should furnish the materials for such work which the teacher will apply by his own conduct, words, and convictions.

¹ *Formal and applied* in the same lesson.

Although it is realized that social conditions among primary school children vary very considerably, yet such variations should have little, if any, effect upon the curricula suggested, which is designed for almost universal application. Differences in social life are best met by *methods* of teaching rather than by changes of curriculum. Differences, however, of physical environment (*e.g.* urban and rural) might well lead to one or two minor changes in the subjects of instruction.

S. E. B.

CURRICULUM OF PRIMARY SCHOOLS, THE.—

There does not seem to be an official definition for primary education. A secondary school, however, "provides a progressive course of general education suitable for pupils of an age ranging at least as widely as from twelve to seventeen." Hence the primary curriculum must be the course for a child up to about 11 years of age. As the infant or nursery school stages last for the child till about 7, there are, at least, four years of the child's life to consider. The body during these four years is not at a period of rapid growth in height and weight, its larger muscles developing more slowly than they have done earlier, and will do later at the "awkward age" about puberty. It is rather the time for the development of many of the accessory muscles, the finer ones necessary for "exactness and grace" in drawing, speech, singing, dancing, and "a host of virtues." (Stanley Hall.) The brain at about 7 reaches practically its full size. Doubtless most of the brain cells are already active; but their development depends on their full nourishment during these years, a nourishment probably considerably promoted by the development of the fine muscles of the hand.

(1) *Physical activities* there must, of course, be in the curriculum. (2) *Manual work* must find a special place, its nature being indicated by the child's stage of development. At 7, *he* (the pronoun is, of course, of common gender here and throughout this article) is like his primitive ancestors; and the school, in its handwork, may help the child to re-live the life of its race, to come face to face with Nature, and to understand the ways of conquering and co-operating with her. (3) But the child is the heir of all the ages, and the curriculum of the primary school must fit him for entering into his heritage by providing for his *intellectual and moral education*. It must, with Froebel, further the growth of innate faculties; with Herbart, it must present a world of many-sided interest; with Montessori, it must leave the child free for his "great work."

I. Physical Activity would, it will be seen, find much natural scope in the constructive work to be described, which would render unnecessary at this stage the organized school games rather artificially introduced into school curricula; though drill may sometimes be desirable. There will be singing and dancing; and there should be swimming, and exercises in breathing—with which will be connected lessons on the care of the body and simple physiology. Rightly conducted, singing, recitation, and reading aloud conduce to physical development, whilst writing and drawing depend on muscular control. All have their place in the curriculum as arts to be acquired, not as ends in themselves, but as instruments for other work or as means of self-expression.

II. Manual Training has, in England, its well-graduated courses of stripwork and carpentry. These

and housewifery (including cookery and cleaning), now confined to boys and girls respectively, might well be made common to both and begun very simply in the primary stage. Knitting and needlecraft may be joyous creative arts for both boys and girls, meeting the desires for decorating, for producing, and for self-expression. If bright colours, large stitches, and a variety of material are used no strain is thrown on the not-yet-fully adjusted mechanism of the eye. Raffia-work, basket-making, and clay-modelling, recognized forms of handwork, are available—from which weaving, brickmaking, and pottery might be developed. Spinning with hand-spindles should be added. Gardening should become general.

Seeing as well as doing would be helpful. The plough and the harvest field, the carpenter's bench and the blacksmith's shop should be familiar. The simple handicrafts and agricultural life of ancient times may be seen in pictures and museums. Their development into modern industries can be seen in the factories of various localities by town children; but a school in the country has obvious advantages. Town schools should become open-air schools for all, instead of only for weakly children, those at the centre being replaced by schools at the outskirts served by municipal trams.

III. Intellectual Work. Few children growing up with such training as that described under I and II would fail to take an intelligent interest in the processes employed, and the people who invented them and those who still use them. This would be the basis for geography, treating of races, and the economic possibilities of the regions of the world; and for history, beginning with early civilizations, leading to the life of the Greeks and Romans, and to our Norse and Celtic forbears. Occasional talks and readings (teachers should be skilful in reading aloud), access to pictures and well-illustrated books, the reproduction of scenes on the part of the children, pictorially, or by models, or dramatically, would be the methods of learning.

The poetry and literature of man in Scriptural and Homeric times should be within reach of the child in his own language. The tales of chivalry would bring him to the Middle Ages and to modern literature. Used in singing and reading lessons, this material would form the basis for talks (oral composition), and lead to self-expression in imaginative and narrative work (written composition). Science and mathematics with processes of sustained inductive reasoning would come later than this stage; but the experience gained in carrying out the practical activities would lay their foundation. Nature study (as little in the schoolroom as possible) would include all the Botany and Physical Geography and Astronomy desirable. Elementary cookery and cleaning would give a basis for Chemistry and Physics later. Arithmetic and Simple Geometry would be necessary for much of the constructive work. The latter might also be introduced by card-sewing, and might often be treated incidentally. There should be much opportunity for number work; and one or other of these subjects would be the place for the realization of the abstract, which should come somewhere into this world of concrete work.

A liberal and easily accessible supply of books is essential. There must be stories of prehistoric man, tales from ancient history and literature, from Celtic and mediaeval romance; books of travel and science, and history and poetry, children's books and grown-up books—for the child once started is

an omnivorous reader. Fiction would, as a rule, be lent for out-of-school reading; while the other books would also be browsed among at will during part of the schoolday. The use of encyclopædias and dictionaries, and other works of reference, will readily be acquired if they are available.

Management and Organization. The carrying out of this curriculum will require child-knowledge and a sympathetic nature rather than scholarship from most members of the staff; but somewhere among them, perhaps in charge of the library, must be the scholar, the man of student mould, who will recognize and welcome a kindred spirit. Besides good readers among the teachers, there must also be music lovers—for the children must hear and study good music as well as good literature.

Organization will be a different art from the present forming of classes and making of time-tables. Some classification will doubtless be dependent on age, since there must be an ordered sequence of development; but there would be advantages in a general grouping based not on "Forms" but on the "House System" (*q.v.*)—that trace of home life in the boarding school which is being transferred to many day schools.

This curriculum may suggest an overcrowded time-table—yet, when we think of what is accomplished by an infant in the first three years of life, we should expect much. If we think of what is done in the succeeding four years by the children in a Montessori school (*q.v.*), we may find a clue to our working. Work on the curriculum here suggested will not be the same for all. We yet know little of the right sequence, whether courses should be parallel or successive, and what are the right proportions between subjects, and between fixed and free hours of work. Hence, with a wide range of activities and a presentation of well-selected subjects, there must be freedom of choice for the child.

The child of 11 or 12 should be able to read, sing, and speak, clearly and correctly; to make a few simple calculations; to handle pen and pencil, knitting, netting, and sewing needles, and a few carpenter's tools; to do simple cooking and cleaning; to swim; and in some cases to handle a boat or harness a horse. He should know, by practice, something of the arts of gardening and weaving, pottery-making, and house-construction. He may, perhaps, in addition, have some acquaintance with the main acts of the life of plants and of some animals, and with the historical and art treasures of his own neighbourhood. That is, his body and senses having been rightly trained, he will have acquired some rudimentary technical skill, and some acquaintance with Nature and man's relation to it. Thus he will be prepared for the secondary stage of his education, for the scientific study of Nature, for the humanities, and for art. He will have made definite steps in what Ruskin calls the essentials of moral and intellectual education.

"Moral education is summed when the creature has been made to do its work with delight, and thoroughly. . . . Intellectual education consists in giving the creature the faculties of admiration, hope, and love."

M. O'B. H.

CURRICULUM OF SECONDARY SCHOOLS FOR BOYS.—The formulation of the secondary curriculum is governed by two main considerations—

(a) What it may assume in the pupils when they enter.

(b) What is the result it is intended to achieve.

(a) There are two main lines of secondary education in England—what is known as the public school system, and the municipal secondary school. The former takes its boys from what are known as preparatory schools, privately owned and managed; the latter draws its pupils from the public elementary schools. The grammar schools stand midway between these two groups, but in an increasing measure conform to the municipal type, to which they have also supplied a model. The municipal secondary and grammar schools, being for the most part day schools, are numerically far greater.

Entrance Examinations. All secondary schools have an entrance examination, oral or written, or both, by means of which they indicate what subjects and what standard of attainment they require for entrance. The public schools have a common entrance examination, organized by the Head Masters' Conference; the papers are for boys of 12 to 14 years of age; the subjects are: Divinity, Latin, Greek, French, English, History, Geography, Arithmetic, Algebra, Geometry, General Science. The standard for admission varies according to the school; the Latin paper implies at least three years' previous study of the language; the standard of marks required by the best schools is high, as the number of candidates is greater than the number that can be admitted; the examinations are of the competitive rather than of the qualifying order. In the day schools the age of entrance is 12; the subjects required are those taught in the public elementary schools, viz., English (*i.e.* reading, writing, spelling, and simple composition; English Grammar, including parts of speech and the structure of sentences; History and Geography), and Arithmetic (including practical measurements). The Board of Education does not allow the examinations for free places to extend beyond the above subjects.

(b) The aim of the secondary school is—

(i) To enable the pupil to relate himself intelligently to the world in which he finds himself. This implies knowledge of Nature and her laws; knowledge of man and his activities; knowledge of God and His will.

(ii) To enable him to use his knowledge effectively for the achievement of his own personal life in the service of his fellow-men. In a word, he is to fit himself to conform to the law of progress.

The Curriculum. The number of subjects attempted and the method of teaching will be determined by the leaving age of the pupils. Some schools cannot hope to retain their pupils much after the age of 16; in others, they remain till 18 or 19. No school has a right to the title "Secondary" which does not provide at the least a four-year progressive curriculum. Schools with the lower leaving-age will aim at a standard which may roughly be defined as that of matriculation at the university; schools with leaving-age 18–19 will aim at sending up pupils to read for the Honours courses at the university and to win entrance scholarships at the university or other institution of university rank (School of Technology or Economics, Agricultural College, etc.).

Pupils in all secondary schools under the Board must take an external examination at the age of 16–17, covering the whole of the curriculum up to that point. After passing such examinations, pupils may be allowed to specialize in some branch of

higher study, the options offered being one or more of the following—

- (a) Latin and Greek, with Ancient History.
- (b) Modern Languages and Literature, with Modern European History.
- (c) Mathematics and Science.
- (d) Commercial subjects, including descriptive Economics and Economic History.

The line of study and standard of attainment in (a), (b), (c) is defined by the higher papers set either for entrance scholarships at the university, or by the local education authorities for their university scholarships. Higher work in commercial subjects (d) has not yet passed beyond the experimental stage at school, nor has it been developed to any considerable extent at the universities.

None of these specializations will be absolute; there should be in each course a generous infusion of English literature, studied rather from the cultural than the critical or philological point of view.

Languages A beginning should at once be made with one foreign language. In most cases this will be French. It is important that there should be at least one period a day given to this new subject. After two years, those scholars who have shown aptitude for languages may take a second language. This is, in most cases, Latin (which is required for the medical and legal professions, and is most important for the right understanding and correct use of English); in schools with a decidedly modern bias it is German (possibly Spanish or Russian). The new language, when it sets in, should have at least one lesson a day. In the classical school, Greek follows Latin in the third year, and is learned concurrently with French and Latin. If pupils are retained till 18-19, German may take the place of French in the last two years, being almost indispensable for intensive work at the university, whether in Classics, Philosophy, or History. In modern schools, boys who have passed the school examinations at 16-17 may profitably begin to learn Latin, with a view to a better grasp of French philology and the study of History at the university.

English, though not the distinctive subject of the secondary type of school, should still be focal. The curriculum will include grammar, composition, and literature. The allowance of time varies; in a school which throws the bias upon language study, less time is needed, partly because the study of foreign languages involves grammatical insight and discipline, partly because the reading of foreign literature enriches the ideas of the mind.

Scripture. Unless the school is on a definitely sectarian basis, the syllabus is based on the Bible. It begins with the historical portions of the Old Testament, and the Gospels, and the learning by heart of selected portions, especially the Psalms. Senior boys study the prophets and the New Testament Epistles. In classical schools the Greek Testament is used.

History. At present the exigencies of examinations confine the syllabus to English history up to the age of 16-17, but there is a growing movement in favour of a wider curriculum, including Continental history so far as it is necessary to the understanding of English history. After the school certificate examination at the age of 16-17, the classical school will begin the study of ancient history, leading on to the more detailed history of the Greeks and Romans. The modern school will study the history of Europe.

Geography will be included by all schools in the first four years of the course. It is carried on beyond that stage in curricula, which are correlated with the needs of commerce, or which make geography part of their science course.

Mathematics, including Arithmetic, Algebra, Geometry (practical and theoretical), leading on to Trigonometry and Conic Sections, will be concurrent with all subjects; and the time allowance will not be less than about five hours per week, whether in classical or modern schools.

Science. The first beginnings should be with Nature study, which may be closely correlated with scouting activities, school journeys and holiday camps, and school gardening. This will lead on in natural sequence to more scientific study of botany and biology. But in most urban schools for boys it is followed in the thirteenth year with Physics, beginning with mensuration, hydrostatics, statics, and followed by Chemistry; the two branches of Physics and Chemistry are then pursued concurrently, but, in the case of the Classical boy, are usually dropped at the age of 16-17. Hygiene (including instruction in sex) is taken in a few schools; but, in spite of its correlation with scout-work and practical use for life, has not established itself as yet in the normal curriculum.

Art. Instruction in the elements of form and colour leads up to the two branches of (a) the painting of flowers and still life, and the application of plant form to design; (b) model drawing, perspective, solid geometry, and machine drawing. Craftsmanship is being introduced (gesso-work, stencilling, etc.).

Manual Training includes a graded course of joints and models, together with knowledge of materials used and the care of tools. Each model should be drawn strictly to scale in plan and elevation before it is made. The work should be correlated with drawing, physics, and mathematics; it may also be correlated with individual hobbies and school needs, so far as may be without compromising the educational purpose of the work. In some schools a course in metal work is added.

Physical Training includes marching, trunk development, climbing, and simple apparatus work; also, if possible, swimming. The time allowed for physical training is necessarily small, because English boys find most of their physical training in athletic sports and scouting. Where it is possible, it is good to make these sports part of the school curriculum and include them on the timetable. If possible, more than one option should be given, so that a boy may throw his heart into the game and not play under a sense of constraint.

J. L. P.

CURRICULUM OF SECONDARY SCHOOLS FOR GIRLS, THE.—The variety, independence, and freedom of English education is shown nowhere more obviously than in the subject of this article. There is no norm, no rule, no common form; it is impossible even to make a general statement which would be accurate or adequate as a summary of the facts or the ideals of those responsible for drawing up curricula. The best method of approaching the subject, perhaps, is the historical. We may discern five influences which have profoundly affected girls' secondary education, and are still acting.

The Influence of Tradition. The first of these may, for clearness, be termed the traditional; and like

most traditions of behaviour and training, it has a real meaning and purpose behind it, and arises from permanent sources in human nature. Its weakness and its strength are due to the same cause—its ideal of elegant accomplishment and charm as the main elements in a woman's preparation for life. It, therefore, presupposes wealth, and a class of women who never have to earn a living, who are provided for by their men folk, who, in return, afford to these men the delight and satisfaction of beautiful and refined homes, like sheltered gardens, where toilers may repose, and renew their strength for labour. Such an ideal is a permanent part, so far, of human nature. It appears in America, where as Veblen points out, a man shows his success and achievement over other men by providing a life of ease, refinement, and luxury for the women of his family. It is traditional in the East, and it still prevails in this country, unacknowledged perhaps, but real, and encouraged by the great wealth which, so far, has been characteristic of the influential classes in our nation. At its best, this ideal requires in a girl's education the study of literature, modern foreign languages, and the arts, including speech, dancing, and deportment. To it is due the fact that when artisan parents can pay for a daughter's education, instrumental music (piano and violin) is the first extra subject they pay for; and French, the language of Society and the traditional accomplishment of the English lady, the second. This very real need for elegant accomplishments, for the refinements and joys of art and literature provided in the home by women, especially where the men are occupied with business, sport, and politics, is, and must be, recognized in secondary schools for girls. Great attention is given to English and history; French is studied by every one; time must be found in or out of school for music. While Graphic Art is to-day a subject in the time-table, or a special study, rather than an accomplishment, elocution and dancing are taking a larger place in the curriculum of the ordinary girls' school than was the case fifteen years ago; and the quite modern use of school dramatic performances as a means of education is popular with parents as well as with pupils, because acting has value as a social asset.

The Influence of the Schools' Inquiry Commission. At its worst, this traditional curriculum fell under the deserved reproach of the Schools Inquiry Commission in 1867, whose report, after very careful inquiry into the state of girls' secondary schools all over England, had great influence for reform. It declared—

"The general deficiency in girls' education is stated with the utmost confidence and with entire agreement, with whatever difference of words, by many witnesses of authority. Want of thoroughness and foundation; want of system; slovenliness and showy superficiality; inattention to rudiments; undue time given to accomplishments and those not taught intelligently or in any scientific manner."

These defects arise naturally when appearance and social charm, rather than solid, practical efficiency in real life, are the aims and purposes of a girl's education; and there is probably no lasting cure for them except national poverty and simplicity of life. The Report recommended as a cure the introduction of sterner subjects into the curriculum, Mathematics in general, and Latin when possible. This has been done, and the belief of the Commissioners that "the essential capacity for learning is the same, or nearly the same, in the two sexes,"

has been justified by fifty years' experience since. Thus came about an identity of curriculum for girls with that long customary for boys and young men, so far as college preparation and the high schools were concerned. Of late, this identification has been attacked both by outsiders and those within the schools, and the attack has been to some extent successful.

The Influence of Regulations of the Board of Education. These have had a wide effect, not only on the new secondary county and municipal schools, established all over the country since the Act of 1902, but also on the majority of the older high schools, which have come in under the Board so as to secure grants. The rules permit great variation: they require the curriculum to provide instruction in the English Language and Literature, in at least one language other than English (with the proviso that, by special permission of the Board, languages other than English may be omitted from the curriculum), in Geography, in History, in Mathematics, in Science, and in Drawing.

"A curriculum including two languages other than English, but making no provision for instruction in Latin, is approved only when the Board are satisfied that the omission of Latin is for the educational advantage of the school.

"Instruction in Science must include practical work by the pupils. The curriculum is required to make adequate provision for Manual Instruction, Singing, Physical Exercises, and Organized Games.

"In schools for girls the curriculum must include provision for practical instruction in Domestic Subjects; and an approved course in a combination of domestic subjects (which includes Needlework, Cookery, Laundry Work, Housekeeping, and Household Hygiene) may be substituted, in the case of girls over fifteen years of age, partially or wholly, for Science and for Mathematics other than Arithmetic.

"An even larger measure of freedom is secured by the further regulation of the Board that individual pupils or special classes may, with its approval, follow a curriculum varying from that approved for the rest of the school."

The regulations are clearly a recognition of the German ideal of general culture (*allgemeine Bildung*), an education introducing all pupils to the main types of intellectual interest. The rules have established a real degree of uniformity in secondary schools all over England, the L.E.A. schools giving more attention to the Humanities (English, History, etc., etc.) than they would otherwise do; and the older kind of high school developing science and practical subjects.

The Influence of Vocational Demand. The fourth influence, likely to act with increasing strength as time goes on, is the new vocational demand, moulding the curriculum by the requirements of practical life. The curriculum of the Royal Naval Colleges at Osborne and Dartmouth, with their Mathematics, Physics, Engineering, one Modern Language, and English Humanities (Literature, History, and Geography) shaped by the needs of the profession, gives the most perfect example of such a vocational course. For girls, the development of housewifery courses is the obvious parallel, with, however, the not unimportant difference that there is, for the girl who has gone through such a training, no certainty of a future spent in household management under conditions of dignity and a living wage. The economic difficulty, that school education in housewifery subjects has little monetary value, and does

not necessarily conduce to securing for a girl a suitable establishment in life, hinders, and must go on hindering, the development of Domestic Arts as the *main* subject of a girl's secondary education. Some persons press this reform strongly, but the schools, so far, are too closely in contact with realities to abandon their existing curriculum. The wealthy girl will pursue either accomplishments, a general literary education, or preparation for college; the girl who must support herself and help to support her relatives requires the general education leading to professional courses: even the training colleges for domestic arts prefer that their students shall not specialize at school. In many schools, however, short courses in Needlework, Cookery, and Housewifery are given at about fourteen years of age, before the pressure of external examination begins. It is still true, in the North of England at all events, that girls of secondary school age learn domestic arts from their mothers, and perform regular household duties, especially at the week-ends and in vacation. Many parents consequently object to time being spent on the domestic arts at school.

Very successful vocational courses in preparation for secretarial and commercial posts have now been worked out; the Manchester High School has, during the last twelve years, developed such a course, taken by sixty older girls or more. About half the time is given to ordinary school subjects: English, Languages, Arithmetic, Geography, etc.—but not Science, Latin, or Mathematics—and the rest of the time to technical subjects. Rural courses have also been established, e.g. the West Riding County School, Knaresborough, where no foreign language is taught; but much time given to Science, specialized Mathematics, Gardening, Handwork, and (for girls) Domestic Arts.

The Effect of Examinations. Amid all the welter of curricula, due to the freedom and variety of English education, and the effect of the influences we have attempted to summarize above, there are emerging certain clear lines of agreement as to a standard school examination, such a test as is contemplated in Circular 849 of the Board of Education. That circular divides school subjects into groups: I, the English Humanities; II, Languages; III, Mathematics and Natural Science; IV, Art, Handwork, Domestic Arts, and other vocational subjects. It considers that pupils who are to receive the certificate testifying to a sound secondary education shall pass in each group except IV, though not in every subject taken separately, considerable choice being allowed as to subjects in the groups. This scheme has been carried into effect by the chief examining bodies, and many girls' schools find that, without alteration of curriculum, the new School Certificate can be taken at about 16½ years of age by all their well-prepared pupils, Mathematics not being compulsory. A second examination (at about 18½) for the Higher Certificate is also held: this, in accordance with the Board of Education plan, will require proficiency in one group of allied subjects—I, Classics; II, Modern Humanities; III, Science and Mathematics—with a lower standard in a subsidiary subject from another group. This scheme will suit older girls, especially the second group (English, French, History, Economics, Geography, etc.), with freedom to choose Art and Music as subsidiary subjects.

The Future. Having endeavoured to explain from past influences the curricula of girls' schools as they are to-day, we may perhaps be not too bold in

venturing to forecast the future in the light thrown on it, not only by such lamps as Circular 849, but by the conflagration of modern Europe. England, her literature and her history, will be a central study; and that Scripture teaching which is traditional in most English schools will receive new life and vigour, and be related more definitely to reality than was the case in 1914. Geography will be more fully studied, and World History, wherever time allows. The position of French will be stronger than ever: tradition, the need for sound linguistic training, and the demands of practical life, will all unite to give it an important place. As to Latin, the present writer believes that it will become the privilege of the abler girls only. Greek is now learnt only by a very few. Probably it might become more generally studied for its own sake in the schools for wealthier girls if games and accomplishments were less popular. The place of German in the future is almost impossible to forecast. For some years it was unpopular with many persons; but already, there is a reaction towards its study, which will remain a necessary one for many purposes—social, commercial, scientific, artistic—even military and political. It ought to have a place in all the larger secondary schools. Italian has vanished from girls' education, though it was part of the original traditional accomplishment. Italy had ceased to impress the English imagination. But this will no longer be true, and the study of the language may revive. Spanish has come in already in a few schools. As the language is easy, especially to girls who know some Latin, it is likely to be taken up more widely. What is quite new is the study of Russian: it has been taught successfully in the Manchester High School, in Leigh Grammar School, and elsewhere, and it should become a regular subject in at least one secondary school in every great city. After all that has happened, proficiency in languages will become more important and more usual in England; and as women have capacity in this direction, the girls' schools will have to give a larger space in their curricula to languages. As to Mathematics and Science, the probability is that both less and more will appear in the curricula, according to the school and the girls concerned. Mathematics is found much more difficult by the average girl than by the average boy. Girls' schools have, therefore, had to give much time and energy to the subject, and the results are often inadequate. We teachers have tried the recommendations of the Schools Inquiry Commission as to Mathematics for forty years, and it has been a wandering in the wilderness to many of our girls. But, on the other hand, certain girls do extremely well, and profit much by the study, not only of easy Geometry and Algebra, but of the more advanced Mathematics usual for boys. For such girls there will be plenty of work in the world outside, in helping with the practical activities that depend on mathematical knowledge. This statement is true for Science also. Girls who have attained sound proficiency in Elementary Science at school, will find this a means towards livelihood either at once, or after college and technical training. The increased demand for vocational instruction in all housewifery subjects, including Hygiene and the Care of Young Children, will mean a better place for Science in the curriculum. Biological science has been found to appeal more strongly to women than do, in general, Chemistry and Physics. Probably even more Botany—and Elementary Biology and Zoology leading up

to Hygiene—will be taught to girls; and only a general elementary outline of Chemistry and Physics, so far as necessary for sound Biological study. A few will continue to do good Chemistry and Physics, but a few only.

It is, as we have said, in Group IV of Circular 849 (the practical subjects) that most development is likely to occur.

The Association of Head Mistresses at their 1919 Conference passed a resolution demanding that Music and Art in Group IV should be placed on an equality with subjects in Group II and III. This shows their desire to develop girls' education aesthetically.

The above forecast of the future growth and character of curricula in girls' schools imply that more will be required, yet the only suggestion for simplification is a decrease in the time given to Mathematics. The available time will be no greater, since with less national wealth, school life will be shortened rather than lengthened. The girls must not be over-pressed; how, then, can a practical teacher contemplate a fuller curriculum? The answer is simple, though threefold. First, there must be no waste in earlier years; preparatory schools must be improved. Second, there must be less demand on a school girl's time and energy from social and even philanthropic activities; fewer parties, bazaars, entertainments, concerts, theatricals, street collections, matches, sports, amusements. We must go back to the old-fashioned quiet ways, and learn economy and concentration. Thirdly, and this above all: the schools must not try to teach every subject to every girl. Each girl must be considered as *a case*, as in a hospital. Pupils must not be sorted out in categories like bits of machinery: they are human, and alive and free in things of the mind, and they get on better if they are not all made to do the same. "Thought is free." This principle is behind the Montessori system, and secondary teachers must learn how to apply it to older pupils. There must be greater intensity and individual concentration, less scattering of intellectual interests. We must find out types of concentrated study, and fit our girls each with what she can best do; and allow each school to concentrate on what it can best teach. Montessori methods, where the girls do the work and the teacher guides, must be adapted to secondary curricula. The Italian *Dottressa* is a better prophet for us in England than the Prussian Ministerium, with its *Lehrplan* and *allgemeine Bildung*—schemes we have in the past admired and tried to follow. To her individualistic and concentrated methods, let us bring our own ancient national ideal of "godliness and good learning," with its vocational aim "that there may never be wanting a supply of fit persons to serve God in Church and State," and it does not so much matter what may be the particular subjects or balance of subjects in our curriculum.

S. A. B.

Reference—

BURSTALL, S. A. AND DOUGLAS, M. A.. *Public Schools for Girls*.

CUTANEOUS SENSATIONS.—There are distributed in the skin receptors for the appreciation of several kinds of external influences. We recognize injurious actions by sensations of *pain*; the mechanical contact of various bodies by sensations of *touch*; and the presence of warm or cold bodies

by sensations of *temperature*. That different receptors are responsible is shown by the fact that isolated stimulation of minute areas of the skin evokes one only of these sensations. The number of receptors in a given area varies greatly in different regions of the skin, that of the tongue and the finger-tips being most richly endowed, especially as regards receptors for touch. These, on account of their special importance in intellectual operations, are dealt with under a separate heading. (See TOUCH.)

Pain. It has sometimes been supposed that excessive stimulation of any sense organ gives rise to pain, but it is now known that there are spots on the skin which always give rise to such sensations; while other spots, however strongly they may be stimulated, give rise only to heat, cold, or touch sensations respectively. The surface of the cornea is capable of affording only sensations of pain, in whatever way it be stimulated. These sensations are probably due to the stimulation of free endings of nerves; no receptor organ for intensifying the force acting is necessary or desirable, reactions not being required unless the stimulus is really injurious. The different kinds of pain, such as a "burning" or a "throbbing" pain, are due to the admixture of other sensations (heat, touch, etc.) with that of pain.

Temperature Sense. When a body whose temperature is higher or lower than that of the skin (about 27° C.) is applied to it, a sensation of heat or of cold is experienced. The receptors for the warm bodies are distinct from those for the cold ones, and can be separately mapped out by localized application of pointed warm or cold objects. The temperature sense is best developed, as a rule, in unexposed parts of the body. The phenomena of adaptation are distinct. Thus, tepid water appears warm to a hand which has previously been in cold water, but cold to one which has been in hot water. The specific sensibility of receptors is curiously shown by the fact that, while a warm pointed object will not stimulate a cold spot, if made hotter it may stimulate the nerve of the same cold receptor directly, and so evoke a sensation of cold. The nature of the receptors for temperature is not yet known. It is possible that they make use of some reversible chemical reaction which is very sensitive to changes of temperature.

The sensations from the general surface of the body are analysed and regrouped by the brain, as a first stage, into three classes, as shown by Henry Head. *Deep sensibility* is derived from receptors below the surface, and consists of pressure sensations and pain; localization is fairly accurate. Cutaneous sensations proper are divided into *protopathic* and *epicritic*. The former are of a more primitive type, and tend to emotional disturbance; while the latter are those connected with the accurate intellectual analysis of stimuli. Protopathic sensibility returns to an area which has been deprived of sensation by section of its nerve, at a considerably earlier date than epicritic sensibility. The capacity of distinguishing the roughness of objects, pain, and heat above 38° C. or below 24° C. are present; but the distinguishing of small differences of temperature, of light touch and its accurate localization, with the discrimination of the distance between two points applied to the skin, belong entirely to the epicritic sensations. A given intensity of painful stimulation is much more unpleasant when applied to an area endowed with protopathic

sensibility alone than it is when epicritic sensation has returned in addition. It appears that the latter has an inhibitory action on the former. W. M. B.

CUTTING (PAPEB).—(See PAPER TEARING, CUTTING, FOLDING, AND MODELLING, HOW TO TEACH.)

CUVIER, GEORGES (1769–1832).—The most distinguished naturalist of his age. He was born at Montbelliard (France); educated at Stuttgart; and, while a tutor on the Norman coast, studied the natural history of marine animals and fossils. He was made Professor of Natural History in the College of France in 1800, and received honours from Napoleon I, Louis XVIII, Charles X, and Louis Philippe. From 1809 to 1811 he was engaged in organizing educational institutions in Italy, Holland, and Germany; and advocated sound education for the working classes.

CYCLISTS' TOURING CLUB, THE.—This was founded, in 1878, for the purpose of protecting the interests of cyclists, and of securing for them special touring facilities all over the world. At that time, cycling was in its infancy, and great prejudice against bicycles prevailed wherever they appeared, and there was great opposition to their use on public roads. Exclusion by law was openly advocated when the old "ordinary" tall machine with rubber tyres appeared. The Club took steps to secure the legal rights of a cyclist as a user of the high road, and in later years it has done much to obtain improvements in the surface of roads.

The Club is confined to amateur riders, and for some years has included motor cyclists among its members.

The Club publishes monthly the *Cyclists' Touring Club Gazette*, in which names of applicants for admission are published for one month before they can be elected. If no objection is raised within seven days of the publication of the *Gazette*, the candidates are elected at once.

The *Gazette* is issued free to all members, and other privileges of members include: Legal assistance in any cycling accident or dispute; assistance and guidance when touring abroad; discounts at many hotels at home and abroad; reduced steamer and railway fares; travel information, road books, maps, and guides.

The Club is governed by a council and a committee, and affiliated to it are fourteen district associations; while for Continental touring it has its own special agents, who arrange for Customs concessions to club tourists, and make contracts with hotels and cycle repairers for the benefit of Club members.

The encouragement of touring is promoted by the Club's unceasing exertions for the improvement of roads; the freeing of bridges from tolls; the promotion of legislation beneficial to cyclists; and the circulation of literature dealing with roads, routes, scenery, hotels, and danger spots.

The district associations foster the interests of cyclists living in more populous centres by providing runs, short outings, lectures, concerts, and other social entertainments, besides giving legal assistance and taking action in matters affecting the members.

The Club affords much assistance to cyclists who study the country through which they ride. It publishes a series of road books containing strip

maps, gradient profiles, and much descriptive information, with key-maps and maps showing main thoroughfares in large towns.

The British Handbook and Farmhouse List contains much information on railway and steamboat charges, hotels, coffee-taverns, and country lodgings.

The Touring Bureau at the Club office affords much assistance and guidance to members intending to tour at home or abroad, and has arranged a system of free reciprocal membership with many cycling clubs on the Continent, in the United States, and in Australia.

Members of the C.T.C. can join the Home Counties Archaeological Society at a reduced subscription. This Society visits places of interest in the neighbourhood of London on Saturdays and Sundays.

The Club office is at 280 Euston Road, London, N.W.1.

CYCLOSTYLE.—A copying apparatus, in which a pen, with a small rotating toothed wheel at its point, is used to write upon a sheet of thin paper saturated in wax and stretched tightly over a smooth metal plate. The teeth of the wheel make minute holes through the waxed paper or stencil, and copies are obtained by pressing ink through the holes by means of an inked roller. Sometimes a smooth stylus is used, but then the surface of the metal plate must consist of a large number of minute points obtained by the intersection of finely divided cross-lines.

CYGNAEUS, UNO ("The Father of the Primary School in Finland").—He was born at Tavastehus, 12th October, 1810, and passed in 1827 from the gymnasium there to the University of Helsingfors, becoming Filosofie Magister in 1836. From 1837 he was for two years assistant pastor and then gaol chaplain at Viborg, and devoted much energy to work in a private school there. From 1840 to 1845 he acted as chaplain to a trading colony of his countrymen at Sitka, or New Archangel, in what was then Russian America. It has sometimes been said that the birthplace of the primary school in Finland was in Russian America. This is true in a sense, but only in a sense. At Sitka he was struck by the distance that separated the cultivated people he met at the Governor's table from the natives that came in to barter the produce of the chase; and the contrast, he observes in the note-books he kept, "raised in me the thought that education, beginning with the influences of the home, and extending through the school- or development-years, is of the utmost importance. Fraternity, equality, freedom—these great thoughts began to fill and animate my soul more and more; and in my lonely wanderings along the shore of the Pacific, and through the primeval forests of America, these thoughts obtained more power over me." His mind was thus prepared for a further development. The next twelve years were spent in Petrograd, superintending a Finnish school, and taking charge of the religious instruction in the other Finnish schools of the city. It was here his half-ripened fancies shaped themselves to a whole through the study of Pestalozzi, Froebel, and Diesterweg.

Educational Work in Finland. His opportunity came in 1857. The year before, Alexander II had visited Finland and promised a new and complete

organization for the primary schools. According to Finnish custom, each citizen has the right, whilst a measure is under debate, to lay upon the table any suggestions he may have for the public good. This was the origin of Cygnaeus's *Strödda Tankar* (*Stray Thoughts on the Intended Primary Schools in Finland*), which, in the brief compass of six or seven pages, is so filled with thoughts and proposals tending to a real education of the people, as virtually to decide the character of the new schools. Cygnaeus was thus the first to make educational handwork—Sloyd, farm-work, gardening—an integral part of the general school system of any country. From June, 1858, to October, 1859, he was occupied in visiting the schools of Finland and Sweden, and in noting latest developments in Germany, Austria, Switzerland, and Holland. The results were embodied in his fuller proposals published in 1861, *Forslag rörande Folkskoleväsendet i Finland*, of which there is a copy in the British Museum. In 1863 he became first Director of the new Finnish seminary at Jyväskylä; and the scholastic organization was definitely fixed by the Ordinance of 11th May, 1866.

Cygnaeus died on the 2nd of January, 1888; and in the following month, Otto Salomon (*q.v.*), who was never weary of acknowledging his obligations to him, devoted a whole number of the *Slöjd undervisningsblad från Nääs* to a striking notice; but the fullest account is to be found in the Life by Cygnaeus's son-in-law, the late Dr. Gustaf F. Lönnbeck (Helsingfors, 1890, p. 132).

(See *Uno Cygneus* in *Journal of Education*, Sept., 1890.) J. S. T.

CYMMRODORION, THE HONOURABLE SOCIETY OF.—This was originally founded in 1751 by a number of Welshmen resident in London. Its original objects were to collect and publish valuable Welsh manuscripts; to form a library of Welsh books; and to discuss questions affecting the history, antiquities, and language of Wales. As they claimed to be direct descendants of the Ancient Britons, the name "Cymmrodorion" (which means aborigines) was adopted, and at their meetings the members discoursed as much as possible in the "Ancient British" language.

A charity school had been established in 1718 for poor children of Welsh parents in London, and was held in Hatton Garden, then in Clerkenwell Green, and later in Gray's Inn Road. About the middle of the nineteenth century this school was moved to Ashford. The Society of Cymmrodorion took great interest in the Welsh school, and each member was, by the rules, expected to contribute sixpence a quarter to the Charity Box. The rules also provided that in the event of the breaking up of the Society, its property should be handed over for the benefit of the school. The museum and library of

the Society were deposited at the School House, then in Clerkenwell Green, under the charge of the schoolmaster, who made a catalogue of the books. The Society had a high reputation for some years, and published some important works, but by the end of the eighteenth century it fell into decay and was of little note until its revival in 1820.

Activities in the Nineteenth and Twentieth Centuries. Under the presidency of Sir William Watkins Wynn, and the patronage of the Prince of Wales, the Society resumed its work of preserving and illustrating the ancient remains of Welsh literature and of promoting its cultivation in the present day.

Out of the Cymmrodorion arose the Canorion, a Welsh Musical Society, with meetings at the *Freemasons'* tavern, giving considerable delight to lovers of Welsh music. Medals and other prizes were awarded by the Society for composition in prose and verse at various Eisteddfodau.

The Society again fell into decay and ceased to exist in 1843, but was revived in 1873, once more under the presidency of a Sir William Watkin Wynn. The present aims of the Society are the improvement of education; and the encouragement of literature, science, and art as connected with Wales.

The Society holds meetings in London during spring and summer for the reading of papers on literature, science, and art, and for the discussion of practical subjects within the scope of the Society's aims.

In connection with the Welsh National Eisteddfod a series of meetings are held in Wales, under the name of "The Cymmrodorion Section," for the consideration of educational, social, and literary questions which concern Wales. From these meetings arose the National Eisteddfod Association and the Society of Welsh Musicians. Owing also to the inquiries instituted by the Society in 1884 and 1885, was founded the Society for Utilizing the Welsh Language.

Publications. A volume of *Transactions* is published annually, containing an account of the papers and lectures given at the Society's meetings, with the yearly report. The Society's magazine, *Y Cymmrodor*, is also published in yearly volumes, and contains the results of original research by scholars into Welsh history and literature. Among valuable contributions to this magazine may be mentioned "The Origin of the Welsh Englyn and Kindred Metres," by John Rhys, D.Litt., Professor of Celtic (Vol. XVIII); and "The History of Charlemagne," a translation of *Ystoria de Carolo Magno*, with critical remarks by the Rev. R. Williams, Rector of Daubedr (Vol. XXI). The Society also collects unpublished records throwing light on Welsh history, and from time to time issues them in its Cymmrodorion Record Series.

The offices are at 64 Chancery Lane, London, W.C.2.

D

DAIRY SCHOOLS. — (See AGRICULTURAL EDUCATION.)

DAIRY WORK, THE TEACHER OF.—(See RURAL SCHOOL, TEACHER IN A.)

DALCROZE EURYTHMICS.—(See EURYTHMICS, THE JACQUES-DALCROZE METHOD OF.)

DALE METHOD OF TEACHING READING, THE.—(See READING, THE DALE METHOD OF TEACHING.)

D'ALEMBERT, JEAN LE ROND (1717–1783).—A French mathematician and encyclopaedist who showed at an early age a passion for mathematics. He was admitted to the Academy of Sciences at the age of 23, and two years later wrote *Traité de Dynamique*, which based all laws of motion on the consideration of equilibrium, and caused a revolution in the philosophy of mechanics. His *Reflexions on the Causes of Winds* gained a prize at the Berlin Academy in 1746. Other works followed on Equilibrium and *Movements of Fluids* (1744), the *Precession of the Equinoxes* (1749), and his researches in connection with the solar system. He published *Opuscles Mathématiques* in eight volumes (1761–1780), containing many treatises on his mathematical researches. He worked for a time with Diderot as co-editor of his *Encyclopédie*, and wrote an introduction as well as numerous mathematical articles. He became secretary to the Academy in 1772 and, while acting in that capacity, wrote biographies of all the members who had died since 1700. His other works include books on philosophy and the theory of music.

DAME SCHOOLS.—Previous to the passing of the Education Act of 1870, there existed, in almost every English village and in many towns, schools in which a housewife taught young children in her own cottage. Shenstone, in *The Schoolmistress* (1737), gives a full description of a dame school and its teacher. The “matron old” tamed “unruly brats with birch” as she turned her wheel around, knitted, or performed her domestic duties. Crabbe (1783) gives a similar description, pointing out the smallness of the room and the consequent overcrowding. The dame schools were privately supported, and both management and instruction were entirely in the hands of the schoolmistress, who usually taught reading and writing effectively, with some elements of arithmetic, grammar, geography, and history. Beginners always learnt the alphabet first from a “horn-book,” that is, a sheet of printed matter covered with translucent horn, “to save from fingers wet the letters fair”; while the later reading books were generally illustrated with crude and badly drawn wood-cuts. Penmanship received more attention than at the present day. A common type of book was *The Child's Week's-work* (1712), containing lessons, proverbs, fables, sections on behaviour, short catechism, conundrums, and anecdotes all copiously

and badly illustrated. *The Protestant Tutor* and many a *Complete Spelling Book* were common. Punishment was a prominent feature in the dame's method, and included raps on the head with her thimble, dunce's caps, labels such as “Idle Boy,” “Lying Ananias”; fastening of culprits to the door-latch with a cotton round the neck, or to the dame's apron with a pin. Since 1870, such schools have almost disappeared.

DANCES, SWORD, MORRIS AND COUNTRY.—There are three species of English folk-dance, the sword dance, morris dance, and country dance.

The *Sword Dance*, which is the most ancient of the three, is generally believed to be the survival of a primitive, sacrificial rite. The dance is performed once a year only, at the Christmas season. It is a ring-dance executed by five, six, or eight performers, each of whom carries a sword in one hand and grasps the tip of his left-neighbour's sword with the other. The climax of the dance is reached when the swords are meshed together in a star-shaped figure and placed around the neck of one of the company, or exhibited by the leader. There are two varieties of the dance: (1) the “long-sword,” in which metal or wooden swords of ordinary size are used; and (2) the “rapper,” in which the weapon is of finely-tempered, flexible steel, about 2 ft. in length. The dance is usually preceded by a song, in which the performers are severally introduced to the audience; while, in some instances, a primitive drama, akin to the Mummers' play, is enacted before the song and continued after the conclusion of the dance.

The *Morris Dance* is an offshoot from the sword dance, and, like its prototype, is still danced ceremonially—at Whitsuntide. It is performed by six men standing in two parallel lines of three. There are two varieties of the dance in which, respectively, the dancers (1) hold a white handkerchief in each hand, or (2) carry a short stick in one or both hands. Like the sword dance it is traditionally a man's dance though, during the present revival, it has been freely danced by women.

The *Country Dance* is, in all probability, a derivative of the quasi-religious rites associated with the May-Day ceremonies. It is, however, many centuries since it lost all trace of its ceremonial origin and became the every-day social dance of the English people. It is danced by men and women in couples, or partners, and is executed in many different formations. The steps are extremely simple, but the figures, which are almost infinite in number and variety, are often intricate. A few traditional examples of the later forms of the dance still survive, but the great store-house of the dance is Playford's *English Dancing Master* (1650–1728), which contains the descriptions—somewhat obscurely worded—of a very large number of dances, upwards of a hundred of which have been deciphered and published in modern notation.

Folk-dancing in Schools. Educationists justify the introduction of folk-dancing into schools on the general ground that the practice of an art exercises and develops the imagination and those faculties which are other than intellectual; and more particularly because (1) physical movements which, as in the folk-dance, are executed under the impulse of emotion and for the purpose of self-expression, are less calculated to produce a stiff, wooden and mechanical bearing than those that are performed in response to the word of command, and with no other aim than that of training and developing the muscles; and, again, because (2) in the folk-dances of their own nation, children have an inherited form of artistic expression which must, from its very nature, be congenial to them. Folk-dancing is a genuine, unspoiled art, because throughout its history its function has been to provide a means of individual and communal self-expression, rather than a spectacle or pageant for the entertainment of others. All its movements are consequently free, natural and unaffected. On its physical side, folk-dancing illustrates in a practical way the fundamental principle that motion is not a matter of the legs, but of body-balance, that the legs are supports not ornaments, and that free, natural movement is initiated and governed by moving or swaying the body and inclining it this way or that according to the direction of motion.

For boys and youths, the *Sword Dance* is an excellent physical and artistic exercise. It demands great agility, celerity and neatness of movement, skilful manipulation of the hands and a nimble wit. Some of the dances are long and arduous, and these must be reserved for those only who are in thoroughly good physical training.

The Morris is a far more highly developed dance than the sword, but technically more intricate and physically more exacting. Owing to its technical difficulties much preliminary practise is needed, and this to some extent detracts from its educational utility, because the essential value of dancing as a school subject is not in the learning but in the actual practise of it. Again, the movements in the morris are strenuous, and the dance must, therefore, be used in the school with great discrimination. Generally speaking, it is a more suitable dance for adults than for children. At the same time, if the aim of physical culture be to acquire complete control over the body, no student can afford to ignore this dance, for it is just this faculty which the morris, with its co-ordinated movements of arms, feet and body, will cultivate.

The Country Dance is, from the educational point of view, the most useful of the three. It is easily taught and quickly learned. It can be danced by quite young children, and by means of it many useful lessons may be taught—in grace of manner, in the simple and unaffected courtesies between boys and girls, in the art of moving easily and naturally, and in bearing a "fair presence." The ever-changing figures call for an active and retentive memory; every movement is rhythmical; while the sober gaiety which pervades the dance creates just the fresh and wholesome atmosphere that is wanted in the school.

Not the least of the many advantages which will incidentally follow upon the introduction of folk-dancing into schools is the flood of good, live, wholesome tunes, which will thereby be admitted

into the schoolroom. And the need of this will be appreciated by those who are acquainted with the kind of music which is too often considered good enough to accompany school drill and other manual and disciplinary exercises. C. J. S.

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DANIEL STEWART'S COLLEGE, EDINBURGH.

—(See MERCHANT COMPANY SCHOOLS [EDINBURGH], THE.)

DANISH HIGH SCHOOLS.—(See PEOPLE'S HIGH SCHOOLS.)

DANISH THE TEACHING OF.—(See SCANDINAVIAN LANGUAGES, THE TEACHING OF.)

DANTE FROM AN EDUCATIONAL POINT OF VIEW.—The educative value of a study of the *Divina Commedia* has at length found appreciation in academic centres, and exclusive importance is no longer attached to the Greek and Latin classics as vehicles of humanistic culture. During the year 1919, Chairs of Italian Studies have been instituted at the Universities of London, Cambridge, Manchester, and Oxford; and increased facilities for the teaching of Italian have been afforded in London, Glasgow, Edinburgh, Leeds, and other large cities. By a study of the *Commedia* is meant grappling with the original Italian; for its author took precautions that his poetic achievements should yield their fragrance to those alone who could read them in the language in which they were composed. Debating whether he should employ Latin—the universal vehicle of literary expression in his day—for the exposition of the poems of the *Convito*, Dante decides against it on the ground that poetry, being compact of harmony set in musical bonds, cannot be translated from one language to another without losing all its beauty and sweetness. Let not the beginner imagine that a proper knowledge of Italian is to be gained without patient study and severe self-discipline. Although, to a careless observer, that language may appear easy of acquisition, no other tongue conceals so many pitfalls for a superficial student. The masculine vigour and subtle delicacy; the exquisite beauty and grammatical precision of that speech demand most accurate scholarship: it offers a priceless instrument of mental and aesthetic training. "So rich is the vocabulary of my mother tongue," said Leonardo da Vinci, "that I have to grieve rather at my failure to comprehend than of any lack of words wherewith to express the conceptions of my mind." The study of Italian, moreover, as compared with that of the dead languages, possesses the further advantage of equipping the student with a medium of intellectual communion with a great modern people, whom historical association, political alliances, and artistic sympathies render dear to English-speaking races.

The Writer. Dante Alighieri, to give him his full name, is a unique figure in the history of literature. Standing on the threshold of the modern world, he looks forward as well as backward. His great trilogy is a vision of the origin,

life, and destiny of man; the epitome of an age; a system of ethics; a judgment of men and things; a prophecy. True, the theological vesture he clothed his thought in and his intellectual symbolism are, in large measure, no longer ours; but the problems of life and of society are fundamentally the same. On them he brought to bear a gigantic intellect, comprehending and absorbing the whole knowledge and speculation of his time. He enjoyed a rich and varied experience of men and things. Poet and man of affairs, philosopher and craftsman, soldier and ambassador, theologian and man of science, schooled by adversity and disciplined by suffering; he possessed that piercing insight into the heart of things which comes of absolute sincerity and undeviating truthfulness, and he expressed his vision with a fierce passion, a concentrated energy, and a virile beauty unparalleled in the history of literature. That is the spell Dante casts over the modern reader. His works are a permanent spring of living water, welling up to those who thirst after truth, peace, and righteousness. The study of Dante is prejudiced in some minds by the fact that it demands familiarity with the history of obscure factions in a host of petty Italian states; but a truer perspective will teach us that as these shallow streams of history are followed down from their sources, they soon join the broad rivers and feel the ebb and flow of the great tide of universal history: they have a very direct bearing on problems that agitate human minds to-day.

His Works and their Relation to his Time. The age of Dante was an age of political idealism; it laboured passionately for an empire of universal peace and justice; an ideal equipoise of the spiritual and secular powers; a world-empire answering to a world-religion; a Holy Roman Emperor, curbing the warring states of Christendom, whose overlordship should be co-terminous with the whole Christian world; who on his high throne and judgment seat should be the direct agent of the associated peoples to give expression and permanent effect to their longing for freedom, peace, and justice. This is the theme of Dante's *De Monarchia*, a treatise characterized by Gregorovius as the first important political work since Plato, Aristotle, and Cicero. The political and theological framework is mediaeval, but the goal aimed at is modern enough. In this treatise, Dante shows how peaceful social life has been gradually evolved by the grouping of individuals into families, of families into tribes, of tribes into cities, of cities into nations. Carry this one stage further, he argues; let nations form one comprehensive brotherhood, and wars will cease. The twentieth century student who takes up his Dante will soon become conscious of many gaps in his mental outfit. He will discover how ignorant he is of practical, as compared with theoretical, astronomy. To follow the poet's time references, a knowledge of the relative positions and apparent motions of the heavenly bodies will be essential: he must know "the path-ways of the sky, the stars, and the moon's travails." On the very threshold of his subject, in the opening chapter of Dante's first work, the *Vita Nuova*, the student will be arrested by a reference to the phenomenon known to astronomers as the precession of the equinoxes. He will be carried back to an age of strenuous and daring intellectual activity; an age when the things of the mind and of man's relation to the unseen powers held a far higher place in human affairs than they do to-day; an age when

man cared for beauty in the product of his hands. It was an epoch when mankind seemed to renew its youth; when life was big with great possibilities and new horizons opened out to human endeavour. Many inherited prejudices relative to the Middle Ages will be swept away; the student will learn to appreciate the vast powers and intellectual majesty of the great Schoolmen and gain a deeper insight into the history of human thought. T. O.

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DARLINGTON TRAINING COLLEGE.—The Training College at Darlington, under the British and Foreign School Society, was opened in 1872 for fifty students. Its establishment was made possible by the generosity of the Pease family. Temporary premises were occupied and the College was under the charge of Mr. Alfred Bourne as non-resident Principal. In 1876 a permanent building was opened for seventy-five resident women students, and a managing committee was selected from residents in the six northern counties. The first Vice-Principal was Mr. J. Langton, M.A., formerly Head Master of the Borough Road Practising School, and a founder of the National Union of Teachers. Miss Smallbones was Principal until her marriage with Mr. W. A. Spafford, M.A., when she became Lady Superintendent and her husband Principal. On the death of Mr. Spafford and the retirement of Mrs. Spafford, Miss Hawtrey was appointed Principal in 1912. The College has been considerably enlarged, and the present accommodation is for 160 students. A hostel has been bought, where eight of the lecturers reside, and the students are divided into five houses, each in the care of a House Tutor. Through the generosity of Mr. J. M. Dent, of the British and Foreign School Society Council, a Nursery School, known as the George Dent Nursery School, was opened in January, 1919, in connection with the College. The school accommodates fifty children between the ages of 2 and 5, under Miss Hodsmen. In 1920 the Practising School was re-named the "Arthur Pease" School, after the late Mr. Arthur Pease, for many years Chairman of the College Committee, and was reorganized under Miss H. V. Stuart (Classical Tripos, Girton) as a Demonstration School for 200 children aged from 5 to 12 years.

DARTMOUTH COLLEGE.—(See UNITED STATES, COLLEGES AND UNIVERSITIES OF THE.)

DARTMOUTH, ROYAL NAVAL COLLEGE.—(See NAVAL COLLEGES, ROYAL.)

DARWIN, CHARLES ROBERT.—Naturalist and philosopher, who first familiarized the world with Evolution (*q.v.*) as a theory based on fact. He was born on 12th February, 1809, at Shrewsbury. His father, Robert Darwin, was a doctor; and his mother was daughter of Josiah Wedgwood, the potter. His grandfather was Erasmus Darwin, physician, naturalist, and poet, whose forecast of the Evolutionary Theory is well worth attention. He went to Shrewsbury School, spent two years at Edinburgh University for medical studies, and, finally, three at Christ's College, Cambridge. He says that "during the three years which I spent at Cambridge my time was wasted, as far as academical studies were concerned, as completely as at Edinburgh and at school." These years, however, afforded facilities for developing certain scientific tastes.

When twenty-two, he joined Captain Fitzroy on H.M.S. *Beagle* as naturalist. He speaks of the five-year voyage of circumnavigation as "the first real training or education of my mind," where he acquired a "habit of energetic industry and concentrated attention. . . . I feel sure that it was this training which has enabled me to do whatever I have done in science." He returned to England in 1836, and within the year began work on the *Transmutation of Species*. In 1839 he married his cousin, Emma Wedgwood; and three years later settled at Downe, in Kent, which became his home for forty years; here he grew his plants, bred his pigeons, and was visited by Hooker, Huxley, Lyell and that wide circle of his friends to whom the charm of his character endeared him. He died on 19th April, 1882.

He combined an amazing power of detailed observation with broad inductive reasoning; he collected and marshalled facts ranging over a vast field, and, in so doing, he never neglected exceptions. His knowledge of detail was combined with a scientific imagination of the highest order, and with a profound sense of truth and impartiality towards his own hypotheses. He had abundant patience, and a faculty for hard work in spite of almost uninterrupted ill-health.

Earlier writers had foreshadowed theories of descent, but with no substance of fact. Darwin's note-books never failed him for material, and his work on *Variation in Animals and Plants under Domestication* must for ever remain classical. His theory of evolution was enunciated in *The Origin of Species*. To the action of natural selection working on minute chance variations, sexual selection, and modification through use and disuse, he attributed the ultimate evolution of forms.

Subsequent work on the non-inheritance of acquired characters, and the Mendelian re-discovery, with its basis in the factorial view of the organism, tend to modify the value of his evolutionary mechanism; but posterity's debt to him is not lessened. He founded the direct method of dealing with evolutionary problems by experimental breeding. He takes the student straight to the facts of variation and heredity, and was amongst the first to assume that the same laws were operating on the human species. (*The Descent of Man*.) He also wrote many papers and books on his geological and botanical observations. N. B.

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DARWIN, ERASMUS (1731–1802).—The grandfather of Charles Darwin, the naturalist. After the completion of his education at Cambridge and Edinburgh, he settled as a physician at Nottingham. He was very active and energetic in his profession, and a strong temperance advocate. He read and wrote much, and devoted much time to botanizing. He established a botanical garden near Lichfield, which suggested a number of poems, including *Botanic Garden, Lives of the Plants*, and *Economy of Vegetation*. He also wrote *Temple of Nature*, or *The Origin of Society, a Poem with Philosophical Notes*, which was published after his death. Darwin's prose works include *Zoonomia*, or *The Laws of Organic Life*; *Phytologia*, or *the Philosophy of Agriculture and Gardening*; and *A Plan for the Conduct of Female Education in Boarding Schools*. He was greatly interested in scientific and mechanical studies and experiments, and invented an ingenious carriage for himself.

DAVENTRY ACADEMY.—(See DISSENTING ACADEMIES, THEIR CONTRIBUTION TO ENGLISH EDUCATION.)

DAVIS, DAVID (1745–1827).—David Davis, dissenting minister, schoolmaster, and poet, was the eldest son of Timothy (Jacob) Davis and was born at Goutre-isaf, near Lampeter, 14th February, 1745. He received a better education than Cardiganshire boys generally got in those days, having passed through preparatory schools at Leominster, Llanbyther, and Llangeler. Being intended for the ministry, he was sent to the College School at Carmarthen, whence he was admitted to the College as divinity student, on the foundation of the Presbyterian Board. Under Dr. Jenkins, tutor from 1759, and Mr. Thomas's successor from 1765, the College was in high esteem for classical learning. It is known that Mr. Davis during his four years there, was a diligent student and that he made great progress in all his studies. He also got some experience in tuition as assistant to Dr. Jenkins at the College School. He finished his college course at Christmas, 1767, and spent the following year mostly in supplying such various pupils in the neighbourhood as required his services. On 1st January, 1769, he accepted a call to become co-pastor with David Lloyd (1724–1779), minister of Llwynrhydown and the associated churches. About the same time, or soon after, he received the offer to become co-pastor with or successor to his uncle the Rev. David Thomas, Llanedi, who was already advanced in years. That church was a strong one the stipend tempting, but he declined the offer, to the great satisfaction of his people. He went to live in the vale of Ayrion, as a guest at Vocallt for seven years, and after that at Plasbach, where he opened a school and kept a small farm. On 15th July 1773, he and a fellow-student received Presbyterian ordination under an oak tree, still standing, and not far from the chapel (Llwynrhydown) which could not accommodate a half of the crowd that had come together.

Ministerial Work. His four or five scattered

chapels were small and always crowded. Like his schoolroom, with its damp earthen floor, they were badly lighted and badly ventilated, with the result that his health, never strong, became worse than usual during the whole of 1778. For this reason he felt he must decline what appeared to be a very gratifying offer, that of a tutorship at his old college, as successor to Dr. Jenkins.

Dr. Rees, the historian of Welsh Nonconformity, says: "It was impossible to say what his religious sentiments were; that he associated more with the Arians and Unitarians than with the orthodox, probably because the latter would not associate with him; but a more benevolent, kind-hearted, and inoffensive man than Davis, Castell Hywel, never lived."

His controversy with the Rev. David Saunders, the Calvinistic Baptist of Merthyr, makes it clear he was no Trinitarian; his translating of Scougal's *Life of God in the Soul of Man* is proof of his evangelical sentiment; while his undertaking a translation of Dr. Taylor on the *Romans* indicates his sympathy with the latitudinarian tendencies of the day.

His son Timothy ranks him as a Unitarian of the same type as Dr. Rd. Price, Dr. Abraham Rees, and Dr. John Evans. Mr. Davis was very corpulent, and from living in the country had become careless about his dress and personal appearance.

One wet Sunday, on his way home from Kilfe to Castell Hywel, Mr. Davis thatched his shoulders with straw, and the vicar of Kilfe, on meeting him, expressed surprise. Mr. Davis simply replied: "A fitting roof for a house of clay."

Work as a Schoolmaster. At the beginning of 1783 we find Mr. Davis is at Castell Hywel, where he soon became known as the most successful classical teacher in the Principality. Mr. Davis taught one way or another for sixty-five years, and, according to the testimony of his pupils, he was an able teacher. His patience seemed almost inexhaustible. In his method, one thing was specially in evidence—a constant and thorough drill. He kept his pupils at a respectable distance, but there was in him that natural dignity which made school discipline easy and ready. On occasions he could be very severe. Through it all, his pupils loved him, and those who had had acquaintance with the rod loved him most. Major Evans, High Mead, never met him but that he gave him a handsome present, saying, "for the many thrashings you gave me. It was you made a man of me!" It was the Major who, after that, honoured his old teacher by placing a handsome monument on his grave.

The attempt to teach the languages through English has prevailed in Wales too long. Mr. Davis followed a different plan. He taught the unknown through the known. His pupils being Welsh were taught to translate every word into Welsh.

Though a Unitarian himself, Mr. Davis did not obtrude his own theological views on his pupils. It may be said that no other individual in the Principality ever made more good scholars or turned out so many who became good schoolmasters.

Mr. Davis never knew what wealth was and perhaps never cared. His income from the four or five churches for many years did not realize £30 a year, and his school fees were only 5s. a quarter. With the high reputation of the school, with terms so low, with board and lodging so moderate, it is no wonder his pupils were drawn from all parts of the British Isles.

David Davis, the Poet. Mr. Davis takes a high position among the minor poets of Wales. His poems are locally very popular still. They were selected and submitted to the Rev. Daniel Evans (Dl. Ddu) in 1823, edited by his eldest son, and published, in 1824, under the name *Telyn Dewi* (David's Harp). The volume is composed mainly of poems in his native tongue, with a few specimens in English and Latin. There are translations from Cowper, Young, Pope, Barbauld, etc.

On 15th November, 1775, he married Miss Anne Evans, of Voelallt, by whom he had nine children, five sons and four daughters. It was during his occupation of Castell Hywel that three of his sons were qualified for the Unitarian ministry and the youngest son for the medical profession. This youngest son joined the Army and died, in 1810, when only 23. Mr. Davis retired from the ministry in 1820, and died on 3rd July, 1827, in his eighty-third year. His remains were interred in the parish churchyard of Llanwenog. R. J. J.

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DAY CONTINUATION SCHOOLS.—(See CONTINUATION SCHOOLS, DAY.)

DAY CONTINUATION SCHOOLS, TEACHERS IN.—(See CONTINUATION SCHOOLS, TEACHERS IN.)

DAY, THOMAS.—(See EDGEWORTHS, AND THEIR CIRCLE, THE.)

DEAF AND DUMB CHILDREN, THE ROYAL SCHOOL FOR.—This was founded in Old Kent Road, London, in 1792, and was originally known as the "Royal Asylum for the Deaf and Dumb Poor." Its foundation was one of the early results of the discovery of methods for instructing the deaf and dumb in the use of spoken and written language. The rich obtained at first the benefits of the discovery, and the successful education given to a few deaf and dumb sufferers among the upper classes led to an effort to form a school for the education of the poor. A society to carry out this work was formed by the Rev. Henry Cox Mason (Rector of Bermondsey) and the Rev. John Townsend; and a school was opened in Bermondsey in 1792, commencing its work with six pupils. Dr. Watson, the first head master, who was the chief instructor for thirty-seven years, was the nephew of Mr. Thomas Braidwood, who may be considered the first of the British instructors of the deaf and dumb.

For the first ten years after the establishment of the school, the average number admitted annually was less than seven. After 1801 the admissions increased rapidly, and from 1815 the yearly total has frequently risen above seventy.

The increase in the number of candidates for admission soon led the committee to appeal to the public for support in enabling it to erect a new building. In July, 1807, His Royal Highness the Duke of Gloucester, the patron of the Institution, laid the foundation-stone of a new building in Old Kent Road. The school was opened in October, 1809, and since that time has provided education and training to upwards of 6,000 deaf and dumb children, of whom the largest numbers have come

from London and the surrounding counties, and the remainder from all parts of the British Islands as well as beyond their borders. As time went on, it became necessary to enlarge the building, and accommodation was provided for more than 300 additional pupils.

In 1862 the Society was incorporated by Act of Parliament, and in the same year the crowded school in London was relieved by the opening of a temporary branch at Margate. A permanent building was erected twelve years later and opened in 1875 by the Prince of Wales (afterwards King Edward VII).

In 1809 the Old Kent Road school was surrounded by open country, but by 1875 it had lost all its rural surroundings and was in the midst of a densely populated area. A few years after the opening of the permanent building at Margate, the committee decided to enlarge it and to reduce the number of children in the London school. Extensive additions were made to the Margate school in 1880, 1886, and 1903-1904, including classrooms, playrooms, and dormitories.

The Old Kent Road Institution was closed in 1886 and the building pulled down. A smaller building was erected and used to provide one year's training for about fifty children in preparation for further education at Margate. In 1902 the committee decided to carry on all its work at Margate, and accordingly sold the Old Kent Road Asylum to the late London School Board.

Thenceforth the Institution has been known as the Royal School for Deaf and Dumb Children, Margate; and has been managed by a body of governors under the patronage of Royalty.

Conditions of Admission. Children are not admitted unless certified as deaf and dumb, and free from other physical or mental defects. The candidates for admission must be personally recommended by subscribers to the Institution, and are elected by votes of subscribers. An annual subscriber of half-a-guinea is entitled to one vote at each of the two elections next after the payment of the subscription, and every additional half-guinea entitles the subscriber to an additional vote. A subscription of five guineas constitutes a life-governor, who has one vote at every election for each sum of five guineas subscribed. Corporations, public companies, clergy who preach on behalf of the Society, and other donors of large sums are also entitled to votes at the elections.

The Educational Organization divides the school into three distinct departments: Junior, Intermediate, and Senior. To the Junior Department, children are admitted at 5 years of age. They are under the supervision of house mothers and receive individual attention. The Intermediate Department includes children from 9 to 13 years of age; and the Senior Department those over 13.

The ordinary branches of education are religious instruction, reading, writing, arithmetic, British history, geography, and drawing. Nearly all the teaching is done by the oral method, but a few children are taught by the silent method. The girls are taught plain needlework, with the use of the sewing machine, cutting out, knitting, household work, plain cooking, and the making and mending of their own clothing and the linen clothes of the boys.

An outdoor summer school was inaugurated in 1911 to accommodate 230 junior and intermediate pupils. Some twenty shelters were erected by the

carpentry class with waterproof coverings and wind-screens, around a large meadow which formed the school playground. The value of such an open-air school was at once shown by the fact that the period following was the healthiest in the history of the school.

The Industrial Departments provide elementary trade instruction under instructors who give their whole time to the work. Among the boys, boot-making, tailoring, garden and farm work, wood-work, and printing are the chief industrial occupations; and among the girls, dressmaking and laundrywork. The school authorities devote attention to "after-care," and find that of those who leave the Institution only a very small percentage fail to establish themselves in remunerative employment. For garden work, a garden of 2½ acres is provided, as well as glasshouses for indoor work.

The educational prosperity of the Margate School has been largely due to Dr. Elliott, who took charge in 1876 of the Margate branch, and in 1878 of both institutions in London and Margate, remaining in charge until his retirement in 1908. To Dr. Elliott was due the instruction by the Oral System, and for many years he was looked upon as the leading authority on the education of the deaf. He organized the National Association of Teachers of the Deaf, and mainly to his efforts was due the foundation of the College for Teachers of the Deaf. He also wrote a number of text-books on teaching.

The London office of the Royal School for Deaf and Dumb Children is at 93 Cannon Street, E.C.4.

DEAF CHILD, THE BEST METHOD OF EDUCATING THE.—The efficient training of the deaf child constitutes one of the most difficult problems in education. Before deciding the most suitable methods, it is necessary to consider what he is and what he may become. He must be compared with the child who hears, and the necessary variations noted. The only physical difference is the damaged organ of hearing. Other defects, such as of sight or of intelligence, may be associated with the deafness, but not necessarily. The ear not performing its proper duty prevents the acquirement of language in its natural form of speech, and, consequently, intelligence, which may be potentially as great as in the hearing child, is not nurtured. The result is mental retardation. Deafness presents wide variations of degree, and may range from mere hardness-of-hearing to complete inability to hear; but its retarding effects upon mental attitude and development are always, to a greater or less extent, apparent. In some cases, deafness overtakes the child after natural speech has been acquired, when the problem of education becomes essentially different.

To discover what the deaf child may become, the study of the normal, or five-sensed, child is necessary. The aim of the education of the former is to lead him to as great a degree of normality as possible. There must always be differences; but his educational treatment should be designed to keep these within the narrowest limits, in order to prevent him becoming, as is often the case, a person with different habits of thought, expression, and general social attitude. The finest result of education in a deaf child is that it should fit him to mingle intellectually, and socially, and happily in the great hearing world; and, from this point of view, it has been said by Dr. Graham Bell that the best school for a deaf child should contain only

one such child and a number of others who hear and speak. This refinement is possible only where the deaf child is educated at home with other children of the family; but generally it represents an ideal, which, although rarely possible of achievement, indicates that the environment in which the child is trained should be as normal as possible.

The Parents' Part. We may now proceed to refer to the methods which should be followed. If we say that our aim is the nearest possible approximation to normality, it is clear that both the conditions of his training and the methods of teaching employed must also be as nearly those of the normal as possible.

It is perfectly obvious that mental starvation during the earlier and more plastic years of life must limit the ultimate point of attainment just as physical malnutrition in those years influences the later physique and health. The first essential in the education of the deaf child is that he must have an intellectual infancy, as nearly as possible concurrent with his physical infancy. It has rightly been pointed out that the failures of this period often lead to something like mental deficiency in later life.

The first efforts should be put forth in the home, and first of all by the mother. The initial difficulty is to set up communication with the deaf child. Gestures and pointing will naturally be used, but the ultimate aim is to connect the child with his environment through language; and preferably, if it can be done, by language in its spoken form—speech. Language may be represented by writing or by spelling its letter forms on the hands. Both of these are clearly impracticable with the very young deaf child under school age. Speech itself has two manifestations, the audible and the visible. The movements of the lips and tongue which produce the sounds of speech can be *seen*, just as its audible effects are manifest to the ear. The deaf child can never be an auditive: he must always remain a visual; and, therefore, these visible characteristics of speech should be utilized for the purpose of setting up the contact of the child's mind, in suitable ways, with those with whom he is associated. The mother should speak to him naturally, and without the exaggerated movement of the organs of speech, using words representing things of interest to him. In this way he may be gradually trained to understand simple language from seeing its movement on the lips and face generally, this facility being called "speech-reading." The mother should be in no hurry to induce the child to speak; he will attempt to do this when interest and the desire to communicate develop. Impression through speech must precede expression, as it does in hearing children; and while the child's attempts at the latter should not be discouraged, such is the delicate nature of the work of developing speech without the assistance of the ear, that the mother should not attempt to definitely *teach* speech. That is the proper task of the skilled teacher. The mother should realize that the child should *see* the word on her lips at the very time when the idea it represents is in his mind, and this as frequently as possible. The necessity for this has led to the oft-repeated advice: "Treat the deaf child as if he could hear."

This home training should continue until the child arrives at an age when he can proceed to a school for deaf children. Already the child trained on the lines indicated above will, upon his entry into school, have conceptions of the *purpose* of

language, the manner in which he must recognize it, and at least some knowledge of its rudimentary forms as seen upon the organs of speech.

Speech-Training in School. The leading consideration is now to develop the ability to speak, and in this work the procedure of the hearing child in acquiring speech should be followed as nearly as deafness permits. That procedure is briefly imitation, inspired by meaning and interest. There are two methods of developing speech in the deaf child: (1) by the direct imitation of words as wholes, or synthetically; and (2) by mastering each of its component elements, afterwards grouping them to form words, or analytically. There is no doubt that the former is the more natural, and that it should be adopted so far as is possible. But the differences in the deaf child, as compared with one who hears, must be considered, in order that the point of breakdown in the synthetic method (which varies in different children) should be immediately recognized and met when it occurs.

To the hearing child, heard-speech furnishes both model and corrective, and he makes the necessary corrections without any knowledge of the organic positions requisite. The "seen speech" of the deaf child can be neither so clear as a model nor so suggestive of self-correction. For the proper production of each vowel sound, there is a distinct conformation of the mouth cavity; and for each consonantal sound, a definite articulation of an organ upon the roof of the mouth or teeth. The latter must be accurately formed to ensure intelligibility and easy production. Those formed at the front of the mouth are most clearly seen and are often secured by the direct imitation of the teacher's organs in speaking; and, as those other sounds whose formations occur behind the teeth and at the ridge of the hard palate depend upon precisely the same emissions of breath or voice, explosive or continuous, and vary only as to the organs used and positions they assume, the organic positions and actions can be generally made apparent to the child through sight and touch. He *sees* the position, and the distinctive expulsion of the breath can be felt upon the hand placed immediately before the mouth, or demonstrated by easy mechanical means. A clear voice is necessary in the utterance of the vowel sounds, which, as may be observed by a comparison of those formed by different hearing people, allow of more latitude in their organic formation. Absolute accuracy should also be kept in view, although the muscular positions for the vowels are "shapes" of the mouth cavity rather than more definite positions and movements of the organs during utterance, as in the consonants.

The teacher should be quick to recognize any failure and to give specific training in the case of any sound faultily uttered. Thus, while the leading principle of speech-teaching is synthesis (and this because it promotes the proper blending of sounds in speech and favours "naturalness" of utterance), analysis should be called upon to correct and perfect the speech so acquired. This indicates a continuous attention to the development of speech, which should generally proceed from sounds formed at the front of the mouth to those formed at the remote point of the speaking mouth—from the seen to the unseen in the direct imitation of words, giving analytical treatment where failure occurs; and, all the time, using words and sentences that have definite meaning and interest.



*School Decoration : --The Chaucer Room, County Secondary School, Long Eaton
Showing a Frieze of "The Canterbury Pilgrims "*



*School Decoration :—The French Room, County Secondary School, Long Eaton
Showing a Painted Frieze*

PLATE XXVIII

But speech is only the means to an end, and that end is a knowledge of the vernacular. To teach speech is not necessarily to teach language in that fullness which is the prime need of the deaf child. Definite and continuous effort must be devoted to the development of language, which can only come about from its use. It must be acquired by imitation and iteration, and must represent things that appeal. Thus, it should be utilized to express the everyday needs and interests of the child in representing the ideas that occupy his mind. The environment of the child should be made such as shall interest him, stimulate his imagination, and lead to the desire to know. He should be surrounded by language, spoken and written. And, even then, his experience with its myriad forms must fall immeasurably below that of the hearing child. To compensate for this loss, the experience he has had with the different constructions of language should be supplemented by definite lessons on them. To undertake this work, the study of language is necessary for the teacher, who must, in the exercises he gives for the purpose, embody those which are really intelligible to the child, of which he has, or can at the moment form, the word-ideas. The basis of this scheme of lessons must be the psychological difficulty rather than structural difficulty, or length of the verbal forms used. Of this, the child must give the indications. The method must be fitted to the child; and this suggests that only those who have made a study of the deaf child should teach him. As time goes on, writing should take an important part in education, in that it gives a second form of representing language and assists in its memory.

General Education. A very early acquaintance with books, suitably selected, should be made. Even in very early years, picture books should be introduced and simple explanations of them orally given. The reading habit, suitably fostered and directed, does very much to advance the ultimate point of attainment in language.

The development of the language habit, as it progresses, makes possible the introduction of distinct subjects of study such as Arithmetic, Geography, History, and Elementary Science. These should be regarded as the purveyors of facts, to be reasoned from for the continuous development of thought to be expressed in language. Hence, they should be so treated as to extend the range of known language.

No method of training the deaf child would be complete unless it included both the proper cultivation of the body and the intelligent use of the eyes and hands. These forms of physical and manual training differ in no way from those suitable to, and best for, the normal child.

The training of the deaf child in manners, cleanliness, and the social virtues is similar to that desirable in hearing children.

The development of character, based upon right motives, should be ever kept in view; and the study of the Scriptures is of the highest importance in this way.

Generally, the speciality of the education of the deaf child is that his teachers have, as it were, to create the medium by which life becomes intelligible. Language, preferably in its spoken form, provides for this; and its habit having been acquired, his education may proceed generally on the lines suitable for children who hear.

The greatest drawback in the work for the deaf

to-day is the parents' lack of knowledge of the conditions and intellectual treatment at home. It is no exaggeration to say the want of such care during the early years of life does more to limit the final result than any other cause. But the schools, so far as they can, must attempt to balance up these early losses.

The education of the deaf child may be complicated by mental feebleness, defective vision, or physical inferiority. In such cases, that method is best which most nearly suits the mentality and physiology of the child; and variations from the procedures given above, even to the extent of substituting finger-spelling for speech, may be necessary.

The method of developing speech may be favourably modified to meet the condition of those children who possess, as many do, serviceable degrees of hearing power. Children who become deaf after having acquired speech need only to acquire speech-reading in order to enable their education to proceed on practically normal lines.

From what has been said above, it is clear that no one method will suit the physiological and psychological conditions of *every* deaf child; but whatever those conditions may be, the best results are attained only when their educational training is made as nearly normal as they permit.

A. J. STORY.

DEAF CHILDREN, TEACHERS OF.—(See AFFLICTED CHILDREN, TEACHERS OF.)

DEAF-MUTISM AND EDUCATION.—The title of this article leads at once to the statement that the two great gateways of knowledge in the school-room are the ear and the eye. Interference with either of these has a great effect on education, but the interference is much greater in deafness than in blindness, for it is through the ear that a vocabulary is built up. Deafness hinders speech, blindness only affects reading and writing: and of these three effective weapons in education, the greatest is speech. In a letter to the writer, Helen Keller puts it well—

"The problems of deafness are deeper and more complex, if not more important, than those of blindness. Deafness is a much worse misfortune. For it means the loss of the most vital stimulus—the sound of the voice that brings language, sets thought astir and keeps us in the intellectual company of man."

The diagrams on page 434 illustrate the effect on the acquisition and use of language which results from the loss of hearing, from the loss of sight, and from the loss of both.

Methods of Teaching. The problem for the teacher of the blind child, then, is to find a substitute for the lost sense of sight. He substitutes the sense of touch—hence the raised Braille (*q.v.*) type by which the blind read. This involves no radical change of educational method, for the ear is still open, and not only language but speech is acquired as by the normal child. But with the deaf child the necessary change is radical. The eye must take the place of the ear. The movements of speech are just as characteristic to the eye as the sounds which produce speech are to the ear. But, unfortunately, many of the movements are hidden within the mouth; *g* and *h*, for instance, are produced in the throat, and cannot be seen. Many other speech movements are half hidden. Only the labials *b*, *p*, *t*,

etc., are fully seen. Still, in the highest type of education as applied to the deaf—that by which speech is taught—the eye is made to take the place of the ear, and it is one of the greatest triumphs of modern education that this substitution can be efficiently made. It is true there are other methods of teaching language to the deaf. If I raise my hand to my mouth as in the act of drinking, I hardly need to explain that I want a glass of water; or if I clasp my hands before my face and close my eyes, I need hardly add "Let us Pray" to an

audience whose devotions I am conducting. Such are natural signs. As far as they go, they are very expressive; but they do not go very far. Both in the schoolroom and in the outside world, they become inadequate. Hence a system of conventional signs—expressive of nothing except to the initiated—has been built up into a language for the deaf. This is a picturesque and expressive language. But it is difficult and often impossible to express abstract ideas in this way. And such a language, when it has been acquired, can only be

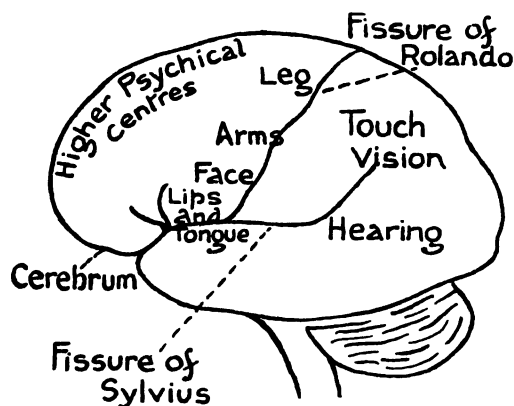


FIG. 1.

Map of the Surface of the Brain, showing approximately the various centres or specialized areas.

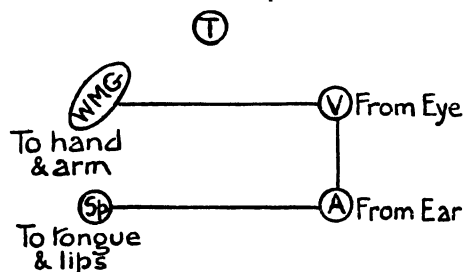


FIG. 3.

Language Centres in the Normal Child. Sp, motor speech centre (glossokinaesthetic centre); W, M, G, writing, manual-alphabet, and gesture centre (cheirokinaesthetic centre); A, auditory centre, including auditory word centre; V, visual centre, including visual word centre; T, touch centre.

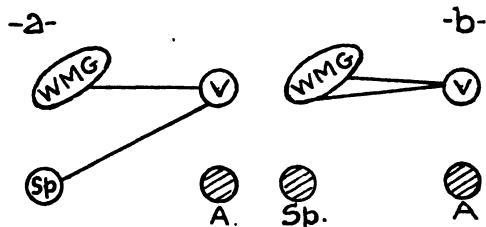


FIG. 5.

Active Centres in the Deaf. a, the orally-taught child (only A is inoperative); b, the manually-taught child (both A and Sp are inoperative); Sp, speech centre; A, auditory centre; V, visual centre; W, M, G, writing, manual-alphabet, and gesture-language group of centres.

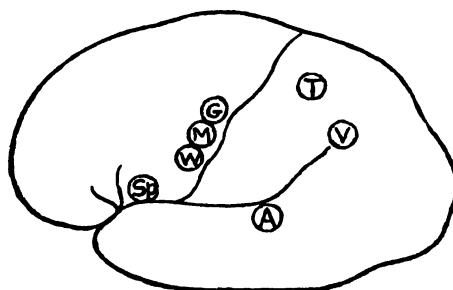


FIG. 2.

Centres concerned in the Appreciation and Production of Language. A, auditory centre; Sp, speech centre; V, visual centre; W, M, G, writing, manual-alphabet, and gesture language centres; T, touch centre. (The group W, M, G, represents Bastian's cheirokinaesthetic centre; Sp, the glossokinaesthetic centre.)

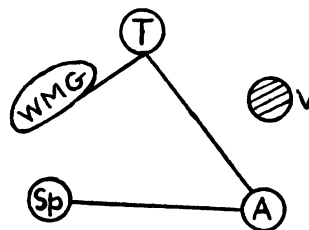


FIG. 4.

Language Centres in the Blind-Deaf. The references are as for corresponding centres in the Normal Child. The centre for vision is out of the circuit, and touch has taken its place.

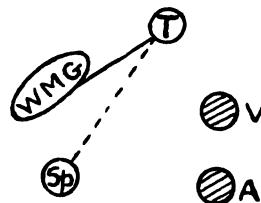


FIG. 6.

Language Centres in the Blind-Deaf. The only active associated fibres are those between T and the group W, M, G, unless speech be taught, in which case Sp. is brought into the circuit.

used amongst the deaf themselves, or by the deaf and their teachers, or by the deaf and their initiated employers or relatives. But this language is not known to the outside world, and the deaf thus taught become and remain a class by themselves. Such is the sign language for the deaf.

There is yet another method of giving language to the deaf, and it is a full and an accurate method. By spelling words on the fingers, any vocabulary can be represented and any idea, however abstract, can be expressed. But, again, the outside world does not know this language, and will not, because it need not, learn it. Under this method, therefore, the deaf remain a class apart, in possession of a full and accurate language known only to themselves, their teacher, and a small circle of their friends.

Various combinations of these two—the sign and finger methods—are in use in the schoolroom, and are called Combined Methods. I see no objection to such combinations if speech is to be rejected, or if it is not to be relied on as the means of communication between the deaf and the hearing. But I see no advantage in such combinations. I have seen higher education and better language on the finger method (*e.g.* at Cabra, in Dublin) than in any combined school. The highest education and the best language I have seen anywhere have been in oral schools (*e.g.* at Philadelphia and Northampton, in the United States), where signs and finger spelling are not used within the classrooms. It is not contended here that the oral method is the only method which should be used in the schools for the deaf. There are some deaf children who cannot be taught orally with profit: *viz.*, the mentally defective deaf children, and deaf children with poor eyesight. But when the oral method is taught, it should be taught exclusively; no combination should be attempted. If I send my daughter to a foreign country to acquire the language of that country, I try to deprive her of the chances of using the English language. I board her in the household of a native family, and I expect her to use the foreign language. So will she learn most quickly. Consequently, in the schoolroom, I wish my deaf child to use speech to the exclusion of signs and finger spelling, if she is to speak well and correctly. The first years of this speech-training will be mechanical and hard; but, once a vocabulary has been acquired, progress will be rapid, and in the end the orally-taught deaf child goes as far as, or further than, the deaf child taught on any other method or combination of methods. And when the orally-taught deaf child leaves school, he is in possession of a means of communication which is common to all the world.

Hereditary Deafness. This last consideration is more important than at first sight appears. If the child leaves school with a language which is not understood by the hearing world, he seeks his like and cultivates the society of the deaf chiefly or solely. Society, pitying him—and pity is so often good-hearted and wrong-headed—establishes a mission to the deaf. Now, without any calculation at all as to the probable results, we have here a perfect arrangement for the propagation of deafness, or rather of deaf people. About half of the deaf are congenitally so, and about half of the congenitally deaf are hereditarily deaf. In the mission to the deaf, the deaf themselves associate with other deaf people or with the hearing relatives of deaf people, and the hearing relatives of hereditarily deaf people carry and pass on deafness with

the same certainty as the hereditarily deaf themselves. So that when the deaf marry, they often marry the hereditarily deaf or the hearing relatives of the latter. And so deafness passes on.

Classes of Deaf. Reverting now to the more purely educational aspects of deafness, it has already been hinted that the deaf are not a homogeneous class. How, then, can they be classified for educational purposes?

1. When a child, say, of 5 years, loses a good deal of hearing from any cause—say, scarlet fever, which has set up suppuration in both ears, which has destroyed most of his tympanic membranes, but which has not involved his auditory nerves—he may be only hard of hearing, or, if he be still deafer, he may be semi-deaf. He may have difficulty in progressing in the large class of an elementary school; but, given a smaller class and more individual attention, he can still be taught through his sense of hearing. He will not lose his speech; he will never become a deaf-mute. Such are the hard-of-hearing and the semi-deaf.

2. If a child of 5 years be taken with cerebro-spinal fever and the result be deafness, the sense of hearing is wiped out altogether; there is no destruction of the membrane or middle ear by suppuration, but the auditory nerve has been destroyed. The result, without some special method of education, is dumbness—acquired deaf-mutism. His auditory sense being no longer available, the sense of sight has to take its place, and lip-reading and special articulation teaching have to be used if his vocabulary is to be enlarged—aye, even if he is to retain the speech he has. But the vocabulary he has is a great asset. He has known the sound and meaning of words, and he will always think more or less as ordinary hearing people do. Such are the semi-mute. The term is not a very satisfactory one, but no very good substitute has been suggested.

3. If a child of 2 years or under loses his hearing completely or almost completely before he has learnt speech, he will lose what baby speech he has, and will, for teaching purposes, be in the same position as a deaf-born child. Along with the congenitally deaf, these very young deaf children form, for educational purposes, the true deaf and dumb.

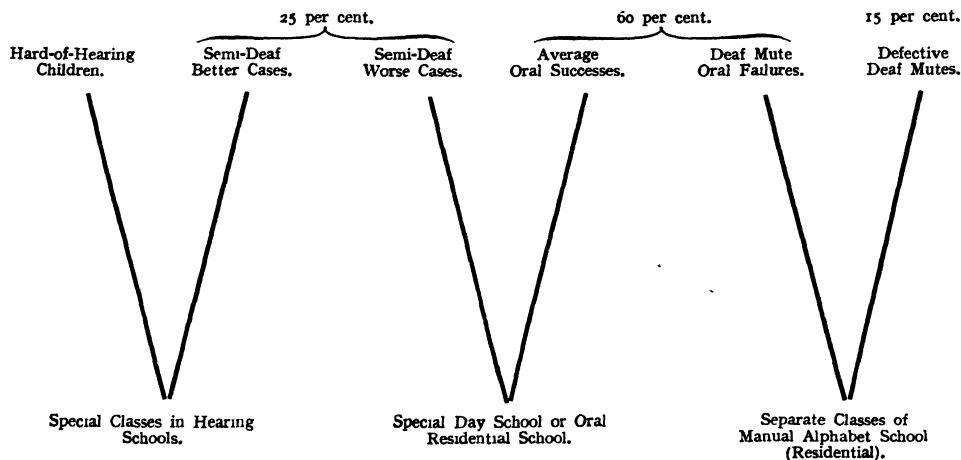
There are other subsidiary clinical features, such as the general health of the child, the condition of his eyesight, the mental capacity apart from deafness, etc., and these have to be taken into account; but it may be put down as a general principle that the basis of classification for educational purposes consists chiefly of these two factors: (*a*) the date of the occurrence of deafness, and (*b*) the amount of residual speech and hearing.

Now, there may be some difference of opinion as to what method of education should be adopted in dealing with a congenitally deaf child, but there should be none regarding the method to be adopted in the cases of the semi-deaf and the semi-mute. Every effort should be made to use the remaining hearing, and to extend the existing speech. To encourage the use of signs and finger spelling in these cases is to increase deafness and to invite dumbness. The oral method taught in a day school is the educational treatment of the semi-deaf and semi-mute. Outside the classroom these children should spend all their time in the hearing and speaking world, and should never associate, in any manner or degree, with the true deaf and dumb. Turning now to children who are born deaf, there

are two astonishing facts about them: (1) They are scarcely ever totally deaf, and (2) few of them are mentally deficient. Taking the deaf all over, only about 15 per cent. are mentally deficient, and it is doubtful whether more of these are to be found amongst the acquired or amongst the congenital cases. The average deaf-born child is just deaf and nothing else. This is one of the foundation facts which should be grasped by education authorities. With care and a prolonged course (say, ten years in school), these children can be given useful speech. But it must always be remembered that they have lost some years, and very

deaf children. Every deaf child should, I think, attend the highest type of school from which he is likely to derive benefit. If this principle be carried out, the hard-of-hearing should attend the day school for the hearing child, where special classes should be made for him; the semi-deaf child should attend the same class as the hard-of-hearing child; or, if he fail there, he should attend either a special oral day school or an oral residential school. But here, in the downward grade of hearing, a sharp line must be drawn. The average deaf-mute cannot benefit from any mere modification of the methods used in hearing schools. He must either have a

SCHEME OF EDUCATION FOR CLASSIFIED DEAF.



precious years they are, of the period of language-formation. From two till six years of age, the deaf child's brain is almost at a standstill, and he never makes up for these lost years. He is always four years behind the hearing child. Could there be any more eloquent argument for beginning the education of the deaf child as early as possible? Lately, at the suggestion of the author, the Glasgow School Board has started classes for little deaf children of three and four years, and the results have been most gratifying. How are we to educate the 15 per cent. mentally deficient deaf? If the education of the hearing mentally deficient is difficult, and if the results are not brilliant, what can one expect when to mental deficiency is added deafness? Each case must be considered on its merits. Where any hearing and speech exist, these should be used and extended; but in the absence of these assets, the child's intelligence must be reached and developed by any method possible. Such children should be in special residential institutions, and should never be in the same class as the ordinary deaf child. The mentally defective always tend to drag down the better equipped children to their lower level, partly because the better children have to observe, and are likely to use, the lower types of language (*viz.*, signing and finger-spelling), and partly because the mentally defective take up the time and attention of the teacher from his proper work—the development of speech and language by the higher methods suited to the majority of his class.

Scheme for the Education of the Deaf. It is now easy to formulate a scheme for the education of

special day school or a residential institution. He should get a fair trial on the oral method, and if he fail he should go to a residential institution where manual alphabet-teaching may be freely used. These oral failures are not necessarily defectives, but there is no antagonism between the methods adapted for their training and those used in the case of the defective deaf, and along with the latter they form, happily, not a very large class. This class, however, requires the special care only possible in a well-appointed institution.

Britain is peculiarly the country where a scientific classification should be carried out. There is no other large country where all the deaf must attend school, and which at the same time is not committed to *one* system of education. In Germany, only the oral system is recognized; in America there is no compulsory education. But here, and now, is the first opportunity of settling a war of methods which has lasted for centuries and, what is of far more importance, of doing what is right by the deaf child.

Laura Bridgman and Helen Keller. The difficulty in educating the deaf or blind child is due to the fact that one of the language-appreciating centres is in abeyance. In the blind, it is slight; in the deaf, it is great; in the blind-deaf, it is nearly insuperable. A reference to Fig. 6 will explain this. Practically, there is only the sense of touch left. And yet this difficulty has been overcome. Laura Bridgman, who was born in 1829, was taught by Dr. Howe—a medical man—to understand and to use language, and by this means to reach a comparatively high stage of mental development. But she was never taught to speak. Indeed, a hereditary tendency to

speak which she showed was curbed by her teachers in case her mental development should be interrupted. It is possible her teachers were right. What they attained for Laura was great, and perhaps they did well not to attempt more with Miss Bridgman. It was enough that Laura should be the forerunner of the most inspiring educational triumph the world has ever seen—Helen Keller. Helen was born in 1880 and, like Laura, lost her sight and hearing before she was two years old. Under Miss Sullivan she made marvellous mental progress, and at the age of ten years made the demand "I must speak." Her triumph is complete. With her thumb on the writer's larynx and her fingers spread over the side of his face, Helen Keller is able to carry on an uninterrupted conversation by speech and speech-reading without finger spelling, signing, or any other adventitious aid. Her acquisition of speech has, so she tells me, increased the rapidity of her thought processes. Through the sense of touch, aided to some extent by the sense of smell, she has brought herself into full communion with the world as known to a five-sensed person. Her powers of thought and expression enable her to lead, rather than to follow, in the literary world, and she will ever remain a subject of study for educators both of the normal and the abnormal. J. K. L.

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DEATH RATE IN SCHOOL CHILDREN, THE.—

Mortality returns amongst people over the age of 5 are not with any special advantage studied in individual years of life. Quinquennial periods are sufficiently short to yield accurate information, and the school age is conveniently covered by the two quinquennia 5-10 years and 10-15 years of age. The mortality rate—very high in the first year of life—falls very rapidly up to school age. During the latter period the rates per 1,000 population for these age periods given in the Registrar-General's Returns for 1901-1910 are—

	0-5 yrs.	5-10 yrs.	10-15 yrs.
All persons . . .	45	3.5	2.1
Males . . .	50	3.5	2.0
Females . . .	41.8	3.6	2.1

The mortality incidence on the two sexes during school age contrasts definitely with that in all higher ages (*i.e.* 15 to 75 years and upwards). From the age of 15 years and upwards, the mortality rate in males has steadily risen as compared with that in females from 1841 onwards—the period covered by accurate registration returns. This is due primarily to a greater decrease of mortality in females than in males. Between 5 and 10 years, however, the male mortality rate has, compared with the female rate, been proportionately lessened—being, in 1891-1900, 99 per cent. and, in 1901-1910,

97 per cent. of that amongst females. Before 1891 the male mortality in this age-period was the higher relatively. At the age-period 10-15 years, the male mortality rate has always been relatively the lower—95 per cent. of the female rate for each of the three decennia 1881-1910.

The mortality rate amongst children of school age has fallen steadily for the last fifty years, so that the mortality in 1901-1910 is less than half of that fifty years ago. The subjoined table shows the percentage decrease in these figures in each decennium as compared with that immediately preceding.

Age Group.	1861-70	1871-80	1881-90	1891-1900	1901-10
5-10	- 5.6	- 19.1	- 18.0	- 18.1	- 18.0
10-15	- 9.5	- 17.4	- 18.3	- 17.3	- 15.8

Fatal Diseases. The principal fatal diseases in the two quinquennia of school life are given in order of fatality as follows—

	5-10 years.	10-15 years.
1.	Tuberculosis	Tuberculosis
2.	Diphtheria	Heart Disease
3.	Pneumonia	Pneumonia
4.	Scarlet Fever	Diphtheria
5.	Measles	Rheumatic Fever
6.	Meningitis	Meningitis
7.	Heart Disease	Appendicitis
8.	Burns and Scalds	Enteric Fever
9.	Other accidents	Scarlet Fever

Tuberculosis is the most fatal of all diseases from 5 to 55 years of age. From 5-10 years, tubercle is largely represented by tuberculous meningitis; whereas between 10 and 15 years, phthisis accounts for nearly half of the deaths from tubercle. Pneumonia is equally severe in both periods. Heart disease leaps from the seventh place in the first group to second in the succeeding five years. Of the other causes of death in these periods, it is to be noted that rheumatic fever ranks fifth in the second group, since the sequelae of this disease produce grave effects in the later years of life—also that scarlet fever is much less fatal in the second quinquennium, having fallen from fourth to ninth place. R. V. C.

DEBATES IN SCHOOL.—(See COMPOSITION, ORAL.)

DEBATING IN SCHOOLS.—(" *Conference maketh a Ready Man.*") A debating society is a common feature of school life. It is generally modelled on the University Union, and allows of considerable variation from the type. It is almost always a voluntary organization. The society appoints a committee of boys, often with the master a member; and the committee arranges subjects and debates. [Let me say at once that most of the points referred to in this paper apply equally to girls' schools and boys' schools.] Sometimes there is a "sharp-practice" evening, when the names of subjects and debaters are drawn at random, and three minute speeches are inflicted on the meeting. Another variant is an "Essay Society," in which papers are written with the aim of cultivating a

literary style, and discussion follows on the matter or manner of the paper; or a subject is introduced bearing on Natural History, Physical Science, or Archaeology, which opens the way to discussion. Occasionally a club is known as a "Political," in which it is the duty of the appointed member to sketch the political events of the past week or fortnight, and then to be subjected to criticism and "heckling."

Inter-school debates are occasionally arranged. Once a year, about thirty upper girls from one school have met the same number of boys from a neighbouring school, and have debated serious subjects with marked success. A minute-book of a debating society in the '80's lies before me as I write. The subjects discussed include Home Rule, Field Sports (with much pleading on behalf of the hare and the fox), Spelling Reform, Triennial Parliaments, Warren Hastings, Good Queen Bess, the House of Lords, the Channel Tunnel, Cremation, Town and Country, and Press Censorship. Until the war broke out, there was a remarkable similarity in the school debates of 1914.

There is no doubt that ease and fluency are acquired by these debates. One boy will deliberately follow Fox in speaking every evening, ambitious to debate some day at Westminster: the chances are all in favour of his being voted a bore, lacking the charm of that master of debate. Many a man to-day attributes his success as a public speaker to school days, when a beginning was made in fear and trembling, unconscious whether he was on his feet or his head. Thinking and careful arrangement of ideas are fostered by these societies. Is it too much to hope that they form an instrument for introducing into the style of speaking and writing "that simplicity which is the best and truest ornament of most things in life?"

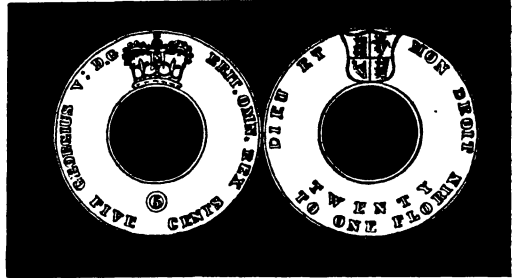
A. ROWNTREE.

DECIMAL COINAGE.—Great Britain, with some of its dependencies, remains isolated in its retention of the unscientific and cumbrous "quarto-duo-decimo-vicesimo" currency, or *£ s. d.* Almost every other country throughout the world has adopted the decimal coinage. Many attempts have been made to introduce a decimal coinage into England, but they have been defeated by an unreasonable fear of imaginary difficulties. In Ceylon the change from *£ s. d.* to rupees (florins) and cents was made without the slightest difficulty, and those who had bitterly opposed it, hailed it as a boon after a few weeks' trial. The proposals for a decimal coinage have been (1) the British dollar, the cent being a halfpenny; (2) the British florin, the cent being nearly a farthing. The latter is preferable, and under it the denominations might be *£-f.-c.*—(pounds, florins, and cents), and the coins and tokens as follows—

Coins unchanged in Value.			New Copper Tokens.	
Sovereign	£	f. c.	Five cents	1·2 pence
Half-sovereign	5	—	Two "	1 half-penny nearly
Florin	1	—	One cent	1 farthing nearly
Shilling	50			
Sixpence	25			

The half-crown, crown, and double florin might still circulate at 1·25 f., 2·50 f., and 2 f. respectively, but their further coinage be discontinued. It is not *absolutely* necessary to create new copper tokens, as the existing copper tokens might circulate, altered in value to the almost inappreciable extent of 4 per cent.; but, to prevent all possible injustice, the new tokens should be coined, and the old tokens be exchangeable at the rate of 25 cents for 24 farthings.

The copper tokens should be of ring shape as illustrated, the 5-cent, 2-cent, and 1-cent pieces having the external diameter and thickness of the existing penny, halfpenny, and farthing respectively.



A Five Cent Token.

A 10-cent Nickel token has been suggested, but its practical necessity is doubtful. The action needed for the introduction of a decimal coinage is to mint the 1·2 and 5-cent tokens in sufficient numbers; to declare them legal tender to the limit of a florin; and to enact the compulsory keeping of all Government, public, and banking accounts in *£ f. c.* The existing copper tokens should circulate concurrently with the new tokens for at least a year after their introduction.

G. M.

DECLAMATION.—The art of oratory was a most popular study among the ancient Greeks and Romans, who divided their teaching into four divisions. Invention and Disposition treated of the selection and arrangement of arguments; Elocution, of the choice of language and rhetorical figures; and Pronunciation, of the management of the voice and gesture. The last department was always reckoned of the first importance, for without a knowledge of this all the other branches were comparatively powerless. Quintilian, in his *Institutes* begins his orator's training in the juvenile and rudimentary stage of education. As a subject of education in English schools, oratory has suffered systematic neglect. Grammar schools of post-Reformation times, which made Latin and Greek the backbone of the education they provided, included declamation as a regular exercise to develop fluency in speaking Latin and Greek. In some cases, declamation is even prescribed by the statutes of the school. At Westminster School, certain hours on Saturday were set apart for it, and the Westminster Play still gives an opportunity for the display of the boys' powers of oratory. But systematic teaching of English speech has had a very inadequate amount of attention in elementary schools. Alexander Bell, the famous professor of elocution and vocal physiology, strongly advocated this teaching "from the Alphabet Class to the University." In his opinion, the first step was the careful teaching of the *powers* of the letters

irrespective of their *names*; and if the teacher possessed the requisite skill in *sounds*, a foundation would be laid for perfect articulation; and at every onward step, conducted on just principles of art, improvement would keep pace with progression. "We should teach to speak, and speak fluently, before we prescribe a single printed lesson." Bell also advocated attention to the vocalization of the breath, so that it should not interfere with vital and pulmonary necessities, and denounced the unnatural pitch of voice so common in the utterances of children in their recitations. Elocution is the highest department of the study of vernacular language, and is not properly so called unless it enables a person to pronounce with propriety, to deliver language according to the usage of polite society, to declaim with physical ease, and to read with the tones of natural conversation. The most modern methods of teaching reading tend to carry out Bell's views.

DECORATION, SCHOOL.—The principles that govern the decoration of a school differ only in their application, not at all in kind, from those that govern the decoration of other buildings. In any decorative scheme, due consideration of simplicity, restraint, and harmony will ensure success. The

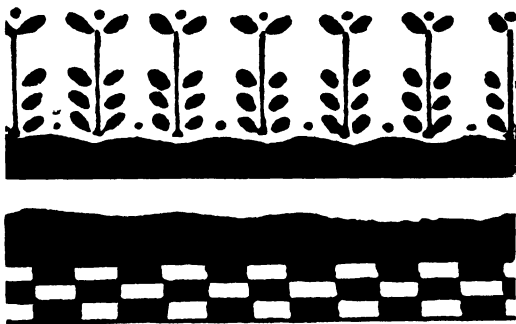


FIG. 1.
Simple Dado Borders.

common initial and most prejudicial blunder is the failure to understand the limitations of a school.

By inspiring and ennobling surroundings, to influence subconsciously the growing mind of the child should be the first aim of education. Hence the supreme importance of the school environment and the resultant evil of the dusty, dowdy ugliness of the average classroom wall. A few maps, hung more or less askew; a trashy, ill-framed print or two; an enterprising advertiser's ugly collection of samples; some scraps of drawing, mapping, writing, or other scholars' work, pinned up as an encouragement—are far too commonly all one finds in the way of decoration. The child is directly influenced towards untidiness and ugliness of mind.

A map hung before a class is for a while noted by the scholars; then its demand on their attention lessens; finally it ceases to stimulate their observation altogether. Its function as a map is over; it has become a mere piece of unnoticed environment. The right thing to do is, of course, to remove the thing at once: it no longer serves a useful purpose, and it is not a thing of beauty. That it is not shifted is because of laziness, ignorance, or carelessness—three related vices.

Simplicity is the cardinal principle to be borne in mind in school decoration. Wood panelling is perhaps the best of all wall treatments, but it is not possible—at any rate, at present—in elementary schools. The plastered wall, then, is the first consideration: if any one wishes to see how beautiful a flat wall-surface of quiet colour can be, let him study one of the wonderful masterpieces of Veermer of Delft. He will probably be astonished to find that the crescendo of the picture's appeal leads up to a sunlit patch of white or grey wall.

A flat, unbroken surface of fairly high tone cannot be wrong; without any decoration whatever, it will give no offence. Any interference with the blank wall means leaving safety for danger—it is increasing the possibilities of mistake.

The usual dado and frieze suggest themselves first as decoration (Fig. 1). The former, of darker shade than the filling, should have a simple stencil border.

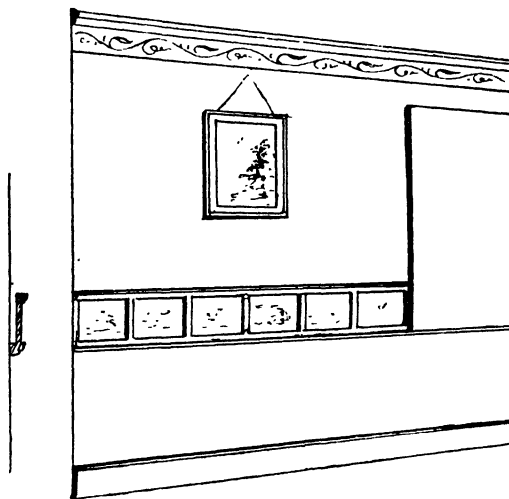


FIG. 2.
Dado Rail for Pictures.

Wood-slat framed panels of plaster or canvas on which a simple pattern is stencilled are restful and satisfying.

In some schools, two lines of picture moulding (of simple pattern) are nailed about 9 in. apart along the top of the dado. These enclose glass, which can be removed through a slot in the upper moulding. Through the same slot, pictures mounted on cards of suitable size can be slipped. (Fig. 2.)

The frieze—stencilled—will sort in colour and tone with the dado, and may be simple or elaborate. On the wall some pictures will be hung. It is of the highest importance that these should be carefully selected.

The most common faults of the school picture are as follows—

1. *Lack of Colour.* Monochrome pictures—photographs, photogravures, and half-tone prints—have rarely any interest but that of subject, and that concerns the scholar only at the first view. To be lived with, a picture must of itself be a thing of beauty and, if in monochrome, must make an appeal by reason of its composition—giving pleasure by the arrangement of blacks and whites. Hence, any monochrome picture to be at all successful as

decoration must have masses of tone sufficiently strong and large to be visible at any point of the room. It follows that black-and-white drawings, mezzotints, and etchings with pronounced masses or lines (e.g. Frank Brangwyn's or Seymour Haden's) are to be preferred. But the general provision of pictures in monochrome rather than colour means starving the colour-sense of the scholars, and is a serious mistake.

2. *Size.* Pictures are nearly always too small. It must be remembered that the picture is to be of interest when viewed from any part of the classroom, and the first interest is the arrangement of the colour masses. If these are too small, the composition of the picture is not apparent and it has no value as decoration. It should further be noted that many reproductions of pictures of the first excellence fail because the size of the original is too great for a reproduction of a size possible for the schoolroom wall. If in any reduction the spots of

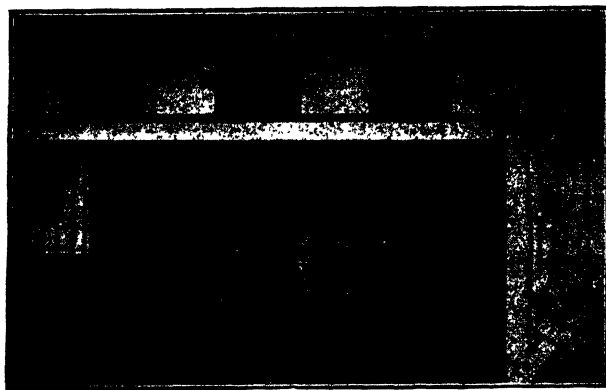


FIG. 3.
Wall Picture Arrangement and Stencil Border.

significant colour are so reduced as to be practically lost, the technique is no longer clearly seen, and the appeal becomes more or less false. Hence in purchasing a reproduction, the scale of reduction should always be borne in mind.

3. *Tendency to Fade.* The three-colour process, by which 90 per cent. of school pictures are produced, makes use of fugitive pigments. The result is that, after exposure for some time to sunlight, there is unequal fading of the constituent colours and only a weak travesty of the original remains. This is unjust to the artist, and a grievous wrong to the children.

4. *Unsuitability of Subject.* Ugly and repulsive subjects are not fit for school walls.

The utilitarian, however, has still its defenders, and "King John signing Magna Charta," "Essex mud-flats," "A section of a colliery shaft," "The making of a steel pen," "A diagram of a crocus," and the like, may yet be found, not as pictures (though they may call themselves such), but as documents. The safest plan is to be guided solely by beauty of composition or colour; though, provided that they do not in any way conflict with this, the following considerations may be allowed to weigh—

(a) Ethical content. The "Madonna and

Bambino" is better than a picture of "Scotch cattle in a mist"; and, despite (b), Raeburn's "Boy with a rabbit," than "The Houses of Parliament."

(b) Historical, geographical, or other instructional interest.

This is a dangerous admission, and many sins are committed in its name. It must be strictly subordinated to the essential consideration—the artistic merit of the picture. Millais's "Boyhood of Sir Walter Raleigh" is a notable success of this type. Plate XXVIII shows a frieze of "The Canterbury Pilgrims," taken from the miniatures of the Ellesmere MS., no less successful in its own way.

So far, with the last example as an exception, only isolated framed pictures have been dealt with. In passing, it may be noted that the frame of a picture is of high importance. If possible, copies of fine museum examples should be made in the manual shop.

Pictures of a uniform type may be affixed to the classroom walls, and, with the help of stencilled surrounds and connections, a unity of decoration can be secured which is impossible with hung pictures. A sketch of this type of treatment is shown in Fig. 3, with a suggestion for a simple surround on the right. Pictures of historical or geographical interest are admirably treated in this way. The designing, cutting, and use of the stencils are quite within the powers of the older scholars.

The best decoration is the painted frieze; but, until education authorities come to appreciate the value of environment to the child, money for this will not be forthcoming. An example is given in Plate XXVIII of a frieze in an English school. It is not impossible in a town where there is an Artists' Society, or "Sketching Club," to organize voluntary work of considerable merit. The cost of material need

not be great. Really good work may be done in the more permanent tints of well-known washable distempers.

There is some slight evidence that interest in a right school environment is being awakened in England, but as yet we are much behind other nations. Finland has perhaps the most beautiful schools. No expense is too great for their equipment, and the works of the most eminent national artists are to be found on their walls.

The U.S.A., too, is lavish in the provision of fine schools, and the various States and townships vie with one another in the beautifying of their school buildings.

In France, a most influential association, the Société Nationale de l'Art à l'École concerns itself with the development of taste and the suitable decoration of schools. It has branches in every important town, and has done excellent work, engaging the services of artists for decorating model schools to serve as inspiration to local effort.

The municipalities of Belgium have for many years interested themselves in school decoration. At Antwerp a prize of about £100 is given annually to the best scholar at the Art School, and, in return, he has to do some mural work in a public building—a school is, of course, often chosen. The result

is that some of the Antwerp schools have most exquisitely decorated rooms.

The great disability from which England suffers is lack of interest in public education.

Up to the present it has not been even possible to purchase suitable pictures for the classrooms, and original wall decoration is, of course, expensive.

A most pleasingly decorated school hall is that of the Boys' Department, Devon's Road Elementary School, Bow Common, London, E.

Manchester School of Art students, several years ago, decorated two schools—St. Mary's Road, Moston; and Mansfield Road.

Wherever there is an Art School, endeavour should be made in the public schools for senior students to have practice in mural work. The result will be profitable to the young artists, and a stimulus and incentive to the children of the schools. S. C.

DECORATIVE ART.—The arts of the brush and pencil—landscape, portraiture, writing, and even design as regards its material—are all "representation." So is a photograph or a paragraph of the daily paper. In all "representation," form or colour, or both, must be present; but the

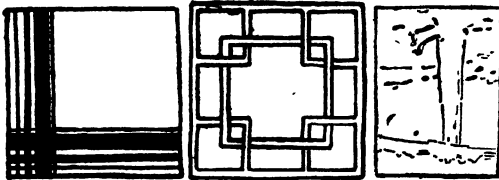


FIG. 1.

FIG. 2.

FIG. 3.

vital element which in the last resort distinguishes the work of the artist in all manners is "composition," "decoration," or "arrangement." The principle of "decoration" or "composition" may be considered as expressed in line, surface, and tone.

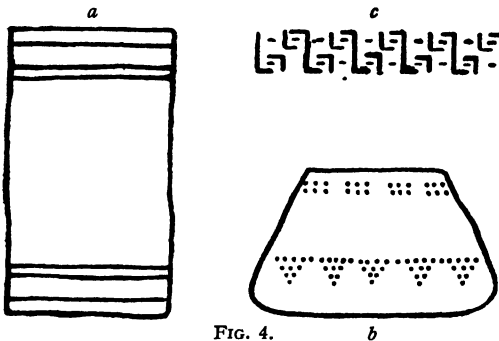


FIG. 4.

b

Unenclosed, and so considered without any reference to space division, a line is simply the trace made by a moving point (*i.e.* the successive positions taken up by it). Certain curving lines are in themselves satisfying in direction, and the Japanese, acknowledged masters in decoration, are accustomed to speak of these as "lines of beauty." Hogarth, in his *Analysis of Beauty*, speaks of the "line of grace" as represented by a fine wire properly twisted round the elegant and varied figure of a cone.

Lines, in a picture or design, divide spaces, and it is the shapes and sizes of these which matter. In Figs. 1 and 2 a square is divided by lines. The latter is the arrangement seen in Scotch plaids. Both are frank pattern design. But the "Battersea Bridge" (Fig. 3) of Whistler is a supreme pictorial expression of space division like to the latter. It is possible that all right space division is regularly

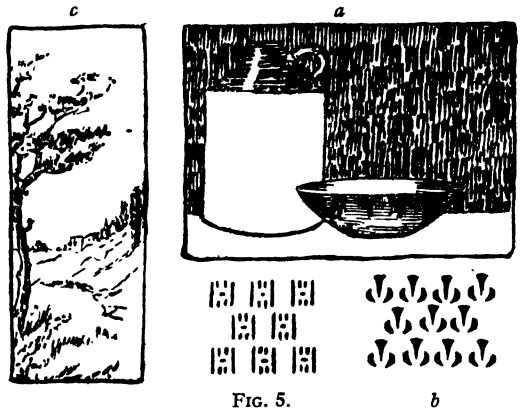


FIG. 5.

b

proportioned through a single composition, each area being in ratio to a less as this is to the next less.

A picture like Whistler's "Portrait of Artist's Mother" shows not only subtle space division, but has a balance of tone values, small masses of intense tone balancing large masses of less intense

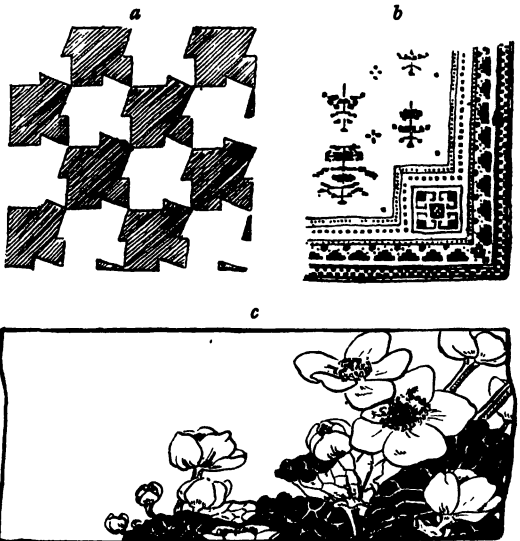


FIG. 6.

and giving a faint though definite ideation of pattern. This, with the additional sense of a third dimension, gives the space composition characteristic of Raphael and the Umbrian School. Thus in naturalistic pictorial art or non-naturalistic design, the sense of decoration (seemliness) discovers itself in right spacing.

This principle comprehends balance, contrast,

rhythm, and harmony, as well as considerations such as unity, radiation, and congruity.

In all right pictorial art, these qualities, however faintly, are nevertheless always definitely suggested, and it is this sub-conscious appeal—the Art which conceals Art—that is the high merit of Perugino and Raphael, of Korin and Hiroshige.

Pattern design, on the other hand, depends entirely on the frank avowal of these considerations. The traditional lacertine ornament of Northern Europe and the geometrical ornament of Islamic peoples, are no less than design making use of natural forms as motifs show them. They are defined in their bearing on pictorial art in Ruskin's *Elements of Drawing* (Letter III). Their relevance to industrial design is well shown in Wooliscroft Rhead's *Principles of Design*.

In school art teaching, which has secondary and consequential implications as important as it has immediate and direct, the principles of composition or decoration should be kept in view from the first.

The training of the designer or decorative artist will from the outset presume the supreme importance of the power of setting out pleasing arrangements. Natural forms or non-natural forms will be for him simply raw material to be used up in his schemes; and appreciation of the principles which govern right design—the faculty of composition—will be more important than skill in representation. Practically, of course, it will be found necessary to pay due attention to both.

The following are typical exercises from a school course with "Composition" as its basis.

Elementary. (Fig. 4.) (a) Drawing and division of oblong. (b) Observation and drawing of Indian or Polynesian basketry. (c) Simple rhythmic borders.

Intermediate. (Fig. 5.) (a) Simple pleasing arrangements and drawing of objects—fruit, etc. (b) Spot patterns. (c) Simple landscape arrangement.

Advanced. (Fig. 6.) (a) Counterchange pattern. (b) Drawing of Oriental rug. (c) Arrangement of flower-spray in rectangle. S. C.

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BERENSON, B.—*The Central Painters of the Renaissance*.
CLEGG, S.—*Drawing and Design*.
DOW, A. W.—*Composition*.

DEDUCTION.—A form of inference which applies a universal rule to an individual case. It is closely connected with Induction (*q.v.*), and the two methods are only different sides of one process which aims at the establishment of a general law of knowledge or belief. By induction, we build up a system in detail; in deduction, we use knowledge which we know covers the whole system.

DEE, DR. JOHN (1527–1608).—Educated at St. John's, Cambridge; was in 1546 one of the original Fellows of Trinity. He was a deep student of science, and gained a reputation as a sorcerer by his mechanical contrivances. He made many visits to Continental seats of learning, in some of which he lectured. Under Queen Elizabeth he became Warden of Manchester College, and devoted his attention to the discovery of the Elixir. His researches and discoveries brought on him a charge of being a "caller of devils," and in 1604 he publicly cleared himself of the accusation at a trial before James I. Aubrey describes him as a good and handsome man, and a great peacemaker. His works, most of which are in manuscript at Oxford,

Cambridge, and the British Museum, deal with mathematics, astronomy, astrology, alchemy, and logic.

DEFECTIVE AND EPILEPTIC CHILDREN.—

The Elementary Education Act, 1899, gives power to local authorities to make (specified) provision for the education of defective and epileptic children. *Defectives* must not be imbecile and not merely dull or backward, but incapable of being effectively taught in ordinary public elementary schools, "by reason of mental or physical defect." *Epileptics* again must not be idiots or imbeciles: simply "unfit" for ordinary school attendance "by reason of severe epilepsy." Adoption of the Act is permissive, but certain obligations rest upon parents. Powers of local expenditure are given—subject to reference to the Board of Education—and the Board themselves may (and do) give grants to day schools and boarding institutions. (See also MENTAL DEFICIENCY ACT, 1913.) A. E. L.

DEFECTIVE AND EPILEPTIC CHILDREN ACT, 1914, THE ELEMENTARY EDUCATION.—

Here we have the Acts of 1899 and 1913 linked up, the former not being compulsory on the authority, and the latter referring to defective adults as well as to children, and to children only when not educable. With certain qualifications, the new Act compels the local education authority to make suitable provision for the education of children between 7 and 16 years of age who are mentally defective. They need not provide a certified boarding-school unless the cases in the area number forty-five; and any such school may be discontinued if the average number of inmates for three years is less than fifteen. The compulsion on parents is now more effective, since it is the duty of the authority to provide the schools. Points of interpretation and decision are left to the Board of Education. A. E. L.

DEFECTIVE, THE MENTALLY.—In considering the attributes of the mentally defective, it is necessary to remember that the normal mind is made up of many complex functions and faculties, combined in varying ways and of varying strength, in each individual. In fact, it is these variations which make up the individual personality. Sometimes certain faculties are so combined as to give particular strength in some direction, so that the individual may be a genius in, say, mathematics or organizing ability, whilst sometimes the combinations produce the opposite; and the individual may, for example, have no ear for music. These are extremes which are only very occasionally met with, and the majority of people do not vary very much above or below the average of their fellow-beings. Where, however, the general average of their faculties is high, and especially if one or more of them is particularly highly developed, one gets a person who stands out intellectually much above his fellows: his powers of judgment and memory, his energy and self-confidence are greater than those of the men around him; he is full of new ideas and original ways of looking at things, and can see all round a subject in a way that is denied to the majority; or he may be endowed in other ways with combinations of faculties which mark him out for success in some particular walk of life.

The general average of a man's faculties may, however, be considerably below the general average of the community, without any particular faculty

being specially well marked. Such a man may be quite successful in a humble way, carrying out the orders of others, and doing good work on lines which have been carefully laid down, but he will probably never think of improving his methods. These people are well able to earn a living, so long as they are doing work they are accustomed to, and can do largely by rule of thumb. They have a certain amount of adaptability, and can learn fresh methods when shown how to carry them out; but they lack ideas and the power to carry things through on their own initiative. Below this group, and taking this utilitarian standard, come the mentally defective. They may be defined as those who, through restricted power of, or arrested development of, the brain, are unable to take an independent and self-supporting place in the social and economic life of the community. They are lacking in reasoning power, initiative, power of attention and application, and in memory, so that they find it difficult to learn by experience. Above all, the power of inhibition is often lacking, and this results in absence of restraint.

Classes of Mentally Defective. The mentally defective are divided into (1) **IDIOTS** (*i.e.* those who cannot guard themselves from such ordinary physical dangers, as fire; (2) **IMBECILES** (*i.e.* those incapable of managing themselves or their affairs); (3) the **FEEBLE-MINDED** (*i.e.* those not imbeciles, but yet requiring care, supervision, and control for their own protection or for that of others); and (4) **MORAL IMBECILES** (*i.e.* those who from an early age display some permanent mental defect, coupled with strong vicious or criminal propensities on which punishment has little or no deterrent). From another point of view, the mentally defective may be classed as of stable temperament, or quiet, and amenable; and unstable (*i.e.* those of unreliable temper, passionate on slight provocation). The latter act largely on impulse, and, as their reasoning powers may be very little developed, their actions may be extraordinary, and even dangerous. A certain but variable amount of instability is present in nearly all defectives.

The Educational Point of View. From an educational point of view, the mentally defective are the despair of their teachers when associated with normal school children. Therefore, and because it yields such much better results, the "Special Schools" recently formed in many towns lay increasing stress on manual training by kindergarten methods, to help to fit them for earning a living. The actual amount of school knowledge which a defective child is able to acquire varies considerably. The great majority do not get beyond the second standard, though they may have to be placed higher because of their age and size. Many, however, whose defect shows itself chiefly in instability are able to do the work of the fourth, fifth, and even sixth standards. The group of moral imbeciles includes those given to persistent pilfering, lying, cruelty, and other anti-social actions. As with all other mental defectives, they must not be judged by the ordinary standards, for their powers of comprehension are too low. The moral standards are some of the last to be developed in a civilized community, and consequently the most likely to be absent in those low down in the scale of development.

A mental defective differs from a lunatic in being incapable from birth of being trained up to the normal standard of mental ability. A lunatic, however, may have been well above the normal,

but has either undergone degeneration, or suffers from some perversion of function (*e.g.* delusions), while it not infrequently happens that the same individual may be affected by both.

Work of the Board of Control. The first organized attempt to estimate the number and distribution of mental defectives was made by the Royal Commission (1904-1908). The proportion was calculated to be about one-third per cent. of the population, thus giving a rough total of 120,000 in England and Wales. Rather less than one-third of these are in institutions (*e.g.* workhouses, asylums, prisons, and charitable or inebriate homes); another third are of school age, and attending schools; whilst the remaining third are living with relatives, or earning a precarious livelihood, about a quarter of them being in receipt of outdoor relief.

Of the cases in institutions, more than one-half are in workhouses; and most of these are not under any power of detention. They are usually of the facile type of feeble-mindedness, and constitute the majority of the able-bodied inmates. They make themselves generally useful, thus saving the guardians considerable expense, and generally, they lead quiet and happy lives. Most of the women inmates of this type have had illegitimate children; it is not uncommon for them to return again and again to the workhouse for successive confinements. The urgent necessity of exercising a power of legal detention of such cases is obvious.

It is estimated that about ten per cent. of prison "ins and outs" are mentally defective. They may be morally defective, and definitely lacking in a sense of right and wrong; or they may be of the facile type, who are often the dupes of designing people; or they may be fairly intelligent individuals, subject to sudden quite uncontrollable impulses on slight provocation. It is not yet sufficiently recognized that a large percentage of the girls in rescue homes and preventive homes and penitentiaries, are feeble-minded of the facile or the impulsive type. Because a girl has given birth to an illegitimate child, it far from follows that she is feeble-minded. Many are genuinely deceived. But there are also many girls of poor, or even fair, intelligence, and feeble will power, who yield readily to a momentary influence. Such girls often make the round of their local rescue homes. They are feeble-minded, and should be treated as such.

Probably at least 60 per cent. of the inmates of inebriate homes are feeble-minded. With intelligence below the average, of deficient will-power, and excitable and impulsive from childhood, their habits are a symptom and not the cause of their feeble-mindedness.

The mentally deficient living with relatives, and not in receipt of poor law relief, number thirty to thirty-five thousand. So long as their near relatives are living, very many of them are affectionately and efficiently looked after, and, later, drift into the workhouse or some institutions, where they are out of harm's way. Unfortunately, however, the parents of many are themselves mentally deficient and incapable of exercising proper control; whilst others take but little interest in their offspring, who are allowed to do as they like, and easily get into mischief.

From a social point of view, the mentally deficient are important in two ways. Their very irresponsibility and helplessness when they are left by their natural guardians to compete openly for their daily food is an appeal of the weak for protection.

Secondly, it is to the interest of the community itself that they should be carefully looked after, because a large number of them are capable of doing good work if patiently trained, although incapable of holding their own in the open labour market. Apart from the happiness which their work brings to them individually, their training and its results are a distinct asset, for they thus help to pay for their own support. Further, if left to their own devices, they get into mischief, and frequently have to be supported out of rates. As already stated, 10 per cent. of prison *habitues* are mentally defective, and about 60 per cent. of inebriates in reformatories are also similarly affected, much public expense being thereby entailed. But far more important is the necessity of preventing the natural increase of the mentally deficient. It is generally agreed that heredity plays the largest part in the causation of mental deficiency, hence it is absolutely necessary to prevent propagation amongst the mentally unfit. Of the unmarried women using workhouse maternity wards, probably at least 50 per cent. are mentally deficient. Few of them have only one child; it is probable that the fecundity of mentally deficient women is at least one and a half times that of normal women.

By the Mental Deficiency Act, 1913 (*q.v.*), the general supervision and care of these cases is placed in the hands of the Board of Control, whilst the particular responsibility is vested in the County and Borough Councils (known as the Local Authority for the purposes of the Act) working through a Mental Deficiency Sub-committee.

This Local Authority is not empowered to deal in any way with cases under the efficient care and supervision of their near relatives, nor are any such powers necessary. Power is given, however, and duties laid upon the Local Authority, to deal with those who, being mentally deficient, are (1) found neglected, abandoned, or without visible means of support, or cruelly treated; (2) found guilty of a criminal offence; (3) undergoing detention by order of a court in a prison, reformatory, or industrial school, or an asylum; (4) are habitual drunkards; (5) on leaving school, considered in need of supervision or guardianship; and (6) are in receipt of Poor Law relief at the time of giving birth or being pregnant illegitimately. All cases dealt with under the Act must be provided by the Local Authority with suitable supervision; but where this does not give sufficient protection, they may be sent to a duly certified institution, or placed under guardianship. The Local Authority must satisfy itself that the supervision is efficient and the guardianship satisfactory. One of the duties of the Central Authority (the Board of Control) is that of certifying and regularly inspecting institutions, and of frequent visitation of all cases under guardianship. There is, unfortunately, a certain feeling against the use of institutions for the mentally defective. It must be borne in mind that they are not used as places of punishment, but essentially for protection and training; and there are safeguards in the Act against the continued detention of any case after it is no longer necessary or advisable. Many mental defectives who have lived at home and been kept in the background, because they are not quite bright, improve wonderfully when placed in an institution or home amongst a number of others of about the same mental calibre as themselves. The standard of efficiency is necessarily lower, and it is a source of encouragement

and happiness to them to find that they can do as well as, and often better than, those with whom they are now brought into contact.

M. D.

DEFFAND, MME. DU.—(See "BLUE-STOCKINGS" AND EDUCATION, THE.)

DELL, WILLIAM.—(See ADULTS, EDUCATION OF.)

DELSARTE AND DELSARTISM.—François Delsarte was born at Solesme in 1811, and died at Paris in 1871. In 1825 he entered the Conservatoire as a student of operatic art. "I had been hardly six months there," he declares, "when, under the killing influence of unintelligent instruction, I saw the voice on which I had built high hopes disappear." He consequently resigned this career, to study and teach dramatic art. He had as pupils or disciples many noted opera singers, preachers, and elocutionists of his time. Rachel, Macready, Sontag, Lind, and Gounod have been mentioned as among his auditors or admirers. Some of his American pupils carried his ideas to the New World, and elaborated them there with an ingenuity that was subsequently repudiated by Delsarte's representatives at home. The fact that he left no records of methodical theory or practice makes it difficult to distinguish his real work from these glosses.

The general tendency of his teaching, however, appears to entitle him to a place among educational innovators. He taught the exhaustive analysis of emotional expression into elements, and their recombination under aesthetic rules. He freed and disciplined separately the various organs of expression.

"Dynamic wealth," he said, "depends on the number of articulations brought into play." He has prescribed positions and movements for fingers, hand, forearm, entire arm, head, torso, limbs, entire body, eyelids, etc., and he required the combination of these in expressive schemata. "If," he says, "after studying the arrangement of an organic form, the inherent fitness of which I am supposed to know, I take possession of that arrangement under the title of method, invariably to produce that form by substituting my individual will for the inherent cause, that is Art."

It is the width in which the plan of dramatic discipline is conceived that distinguishes Delsarte from his predecessors and from most of his successors in dramatic and elocutionary instruction. Thorough-going analysis and synthesis have indeed been applied within more restricted spheres of interest, such as hygienic exercise, stage dancing, musical movement. But Delsarte's enterprise is one which co-ordinates the art of expression with scientific intellect itself, for science is just the analysis and synthesis of conscious presentation or, as Kant named it, intuition. This is a task beyond the needs of "the actor's art," as that art is explained by Gustave Garcia and other accepted teachers.

A systematic discipline of the agents of expression, over and above language, might open up a new prospect in human culture for "the man that is to be." Its acceptance and progressive refinement would promote that "solidarity" of mankind in thought and feeling on which are built such great hopes by both educationists and moralists. Can it be that those "arrangements of organic form" of which

Delsarte speaks, and which Darwin subsequently showed to be registers wrought in the deep folds of our subconsciousness, far-back racial reactions to the emergencies of primitive life—can it be that they are an organic reserve for mankind to utilize in its spiritual progress?

It is doubtful whether Delsarte would have accepted the discoveries of Darwin in the analysis of expression or the laboured detail recorded by Mantegazza in its synthesis, as finally stereotyping the "inherent fitnesses of arrangement" which are to be approved. For in many of his sayings he insists that art is not a mere imitation of Nature, but "relates scattered beauties to a superior type"; and the art of expression is not, consequently, the mere recovery of what is primitive and a foretaste of what lies in the future; it is "the tendency of the fallen soul" towards its elemental purity, or its potential splendour.

Principles of the System. In a system of conceptions and discipline dominated by "purity" and "splendour" as their hope and aim, we cannot expect the principle, or guiding idea, of the analysis, or the axiomata media of the synthesis, to be otherwise than arbitrary, or at least to appear so. Both Delsarte's principles and his axioms are far from convincing to the modern psychologists or elocutionists. And the elaborations made in America, chiefly in the aesthetic interest, are still less so. The speculative idea under the guidance of which Delsarte distinguishes as several in function, the organs of expression, and as several in nature the pulses of our inner affective experience, is that of a trinity, an idea which has been a favourite one with speculative theorists on many subjects and in many times.

"The principle of my system," he says, "lies in the statement that there is in the world a universal formula which can be applied to all sciences, to all things possible—the trinity—our being is life, mind and soul—man feels, thinks, and loves."

Under what we might call a postulate of method, the varied drifts in emotional experience are correlated with organic members and motions (*e.g.* torso, head, limbs; expansion, contraction, poise).

"To each spiritual function responds a function of the body, to each grand function of the body corresponds a spiritual act."

And, finally, instead of the interminable catalogue of varieties in emotion of which some modern psychologists have complained, there are laws for the reconstruction of expression under the prevailing currents of feeling from moment to moment, *e.g.* "passional expression passes from the shoulder where it is in the emotional stage to the elbow where it is in the affective stage, to the wrist and the thumb, where it is susceptible and volitional."

L. BROUGH.

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DELUSION.—A delusion may be defined as a false belief. Delusions are closely allied to hallucinations, and often appear in connection with these. They differ, however, from hallucinations, in that they are false beliefs rather than false sensations, are generally persistent, and involve more or less elaborate reasoning.

Delusions are characteristic of certain types of mental disorder, where they occur in almost endless variety. The two commonest types are where (1) the patient regards himself as a great historical character; (2) he considers himself the subject of some definite persecution. A strong, persistent delusion may occur as the only symptom in a case of monomania, and have little effect upon the patient's actions. A patient convinced that he is Napoleon the Great will readily perform menial jobs allotted to him. The striking feature of a delusion is its fixity; a patient is impervious to argument, and will maintain his belief unshaken by any proofs. (See also MEGALOMANIA.)

M. J. R.

DÉMIA, CHARLES (1836-1889).—The founder of the Sisters of St. Charles, was born at Bourg; entered the Church; and became, in 1865, visitor extraordinary of the diocese of Lyons. In 1864 he had founded the "little schools" in the diocese of Lyons, and was appointed their director in 1872. The good work of these institutions was so great, that the bishops of other dioceses in the south of France wished to have their teachers trained by Démià. In 1876 he founded the community of the Sisters of St. Charles for the education of little girls. This is the only institution of his which survived the founder until modern times. His view was that only priests should give either primary or classical education. Démià was one of the early advocates of the simultaneous method afterwards employed by De la Salle. He divided his class into four or five groups, each having the same book, in order that all the children of the same group might receive the same lesson; and required that each child should follow when one began to read, holding his finger or marker on the words that were being read.

DEMobilization and Education.—Education in the Army has been dealt with in another article (ARMY, EDUCATION WITHIN THE.) From the date of the signing of the Armistice (11th Nov., 1918), the soldier's thoughts were turned towards his normal occupation. He welcomed any form of education which promised to increase his earning power. Systematic efforts were made by the W.O. Staff Directorate of Education to provide short courses of vocational training; but the choice of subjects was, necessarily, limited by the appliances available. It was impossible to provide the apparatus with which only a university or a technical institute is equipped. There was, within the Army, abundant material for the teaching of certain subjects, such as motor engineering. Even electrical or mechanical engineering could be taught in theory, with some illustrations. The mathematics, physics, and machine-drawing upon which some skilled trades are based could be taught without elaborate appliances. Agriculture, market gardening, and small cultures generally could be practised in all camps which were favourably placed. Subjects which need no apparatus are those connected with Commerce in its most comprehensive sense, including commercial law, transport, and the economics of supply and demand. A special School of Commerce was opened on Salisbury Plain for officers about to return to civil life. Opportunities of learning foreign languages were everywhere afforded. But a greater difficulty had to be faced than the provision of scientific and

technical education in the absence of laboratory equipment.

Teachers. Before the Armistice, the War Office had at its disposal a large number of soldiers who were teachers by profession. As soon as demobilization commenced, all teachers were scheduled as "pivotal" men. Amateurs, however able or well-intentioned, sometimes make poor substitutes for experienced teachers. Criticism, so far as it has reached the writer, has been directed against the teaching. Many men who were determined to reap the full benefit from the facilities which the War Office provided were disappointed and discouraged owing to the inefficiency of their teachers. This great and really insuperable obstacle does not invalidate schemes for the education of men after their release from service. The lads who were enlisted soon after leaving school, or after a first or second year at a university or other institution of higher education, had much lee-way to make up. They had lost from one to five precious years. They had forgotten much that they had learned. Their start in life had been delayed. They would be late in becoming established in their chosen careers. In the interests of national efficiency, it was necessary to give all young men who had had a sound general education the opportunity of qualifying for those occupations which need special training, in order that the wastage of young life entailed by the war might, to some extent, be made good. With this end in view, the Government took prompt and most liberal action.

Facilities for Students. All students were immediately demobilized. Every man who before enlistment had entered, or had made arrangements for entering, an institution of higher education, was allowed, at once, to take up his course of training at the point at which it had been interrupted. Those who had not passed a qualifying examination were allowed by the universities to matriculate, on the production of evidence that they were likely to profit from a university education. To all who had already attained to the standard of the intermediate examination for a degree, the Board of Education made at once an interim grant, up to £35 per term, on receiving an assurance from the principal of their university or college that they were in need of financial help.

In order that no man should miss the opportunity of training for a professional or technical career, a District University Committee was established in each university centre, entrusted with the responsibility of judging as to the aptitude of the applicants for the course on which they desired to embark, and inquiring into their financial circumstances. Subject to the approval of the Appointments Department of the Ministry of Labour, this committee was empowered to make a grant for maintenance up to £175 a year, and for fees up to £50. For the benefit of those whose training would be carried on outside the universities, at technical institutes, in offices, or in industrial undertakings, a similar committee of business men was empanelled in every large town.

For men who had already entered upon their professional careers, the various institutions of higher education arranged "Refresher Courses," lasting for six months, as a rule. In preparation for numerous occupations for which but a short period of specialized training is required, they provided "Intensive Courses." The list is far too long for enumeration. Such subjects as telegraph engineering,

quantity surveying, the duties of a sanitary inspector, are included in it.

Early in the war, universities, technical institutes, and special homes or schools began to provide courses of training for men disabled by wounds or sickness from returning to their pre-war occupations. During the summer of 1917 the Pensions Board became responsible for this work. Elaborate schemes, for training for the skilled trades extending over from one to three years, were worked out in co-operation with the various trade unions.

For the first time in the history of the world, belligerents have recognized that every man called upon to defend his country has a claim to restitution. During the war, all institutions for adolescent or adult education were, necessarily, depleted of their students. As early as the spring of 1919, they were crowded not only with men whom the war had held up, but also with men who, but for the offer of financial assistance, would never have contemplated the prospect of entering their walls. The number of the awards made under the Scheme for the Higher Education of ex-Service Students for courses in England and Wales was 26,800, for courses in Scotland 5,425, for courses in Ireland, 900, up to the summer of 1920. A. HILL.

DEMONSTRATION SCHOOL.—(See PRACTISING SCHOOL.)

DEMONSTRATOR (UNIVERSITY).—(See TEACHERS AND DEMONSTRATORS UNIVERSITY.)

DE MORGAN, AUGUSTUS (1806–1871).—He was a very original writer on mathematics and logic; his work on the history and bibliography of mathematics is of permanent value; and his influence on the teaching of mathematics was wide. His whole career was marked by independence and conscientiousness, which he put far above worldly advancement. He took his B.A. degree at Trinity College, Cambridge, but refused to take his M.A. because it then involved assent to the Thirty-nine Articles. He was appointed Professor of Mathematics at the newly-founded University College, London, in 1828; and resigned in 1831 in consequence of an attempt to restrict the independence of another professor. He returned as Professor in 1836, and finally resigned in 1866, again because of his conscientious objections to the conduct of the Council. Work for University College was, on the whole, very pleasing to De Morgan on account of its strict neutrality in religious matters. He wrote a number of important treatises for the Society for the Diffusion of Useful Knowledge, founded in 1826 by Brougham; and was a large contributor to its *Library*, its *Penny Cyclopaedia*, and to the later *English Cyclopaedia*. In 1828 he published a translation of some chapters of Bourdon's *Elements of Algebra*; and in 1830 issued his famous *Elements of Arithmetic*, which passed through several editions and "began a new era in the history of elementary teaching in England; devoting, as all his books did, far more space and labour to the logical processes by which the various rules are demonstrated than to the more technical parts of the subject" (R. H. Hutton). Other noteworthy books were his *Elements of Algebra, preliminary to the Differential Calculus* (1835); *The Connexion of Number and Magnitude: an Attempt to explain the Fifth Book of Euclid* (1836); *Elements of Trigonometry and Trigonometrical Analysis, preliminary to the Differential Calculus* (1837); and *Trigonometry*

and *Double Algebra* (1849). Among tracts by De Morgan published by the Society are *The Study and Difficulties of Mathematics* (1836; new ed., Chicago and London, 1900), and *The Differential and Integral Calculus* (1842), which began to be issued in parts in 1836, and in which a departure from Lagrange's method of series was made, and the clear method of limits used by Cauchy adopted. The valuable *Elementary Illustrations of the Differential and Integral Calculus* (1832; new ed., Chicago and London, 1900) forms part of this work. De Morgan insisted on fundamentals in teaching and objected to "cramming" methods. He made valuable contributions to the *Encyclopaedia Metropolitana* (1835 and 1837), and to the *Quarterly Journal of Education* (1831-35); he also did very important work in generalizing the Aristotelian syllogism into a logic of relations (*Formal Logic*, 1847; *Syllabus of a Proposed System of Logic*, 1860; and papers, printed in the *Transactions of the Cambridge Philosophical Society*, and read between 1846 and 1863). His famous and amusing *Budget of Paradoxes* (1872; new ed., Chicago and London, 1916) should be mentioned. He was also much interested in bibliography. P. E. B. J.

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DENMARK, EDUCATION IN.—The Danish public elementary school (*Folk-skole*) was established by the Act of 1814, which orders compulsory instruction for boys and girls from 7 to 14 years of age, either at school or at home. The latest revision of it was in 1908

The whole population of Denmark is about 2,750,000, of whom 560,000 live in the metropolis, 555,000 in the other towns, and 1,650,000 in the country. The number of *Folkeskoler* is 3,400, with 350,000 boys and girls, instructed by 6,050 male and 3,650 female teachers. As a rule, the number of children in a class must not exceed thirty-five. The 350,000 children form 89 per cent. of all children between 7 and 14 years, the remaining 11 per cent. (17 per cent. in the towns, 7 per cent. in the country) being taught in other schools—in secondary schools and in private elementary schools—of which the 200 *Grundtvigian Friskoler* are the most noteworthy. These *Friskoler* are free in their methods, rather than free from payment; they are in closest connection with the homes, and are impregnated with influences from the People's High Schools (*g.v.*). Unpretending though they be in exterior, they have exercised a great influence on the methods of the public school. Only 0.13 per cent. in the towns and 0.70 per cent. in the country, mostly children under ten, are educated at home. It is the duty of the School Commission (see below), at least once a year, to ascertain that all such children do not fall below the standard attained in the public school; and, in case of failure, to order the children's removal thereto. The State even provides small grants for such schools, if the local authority thinks well enough of them to make a grant also. Perhaps Denmark is the only country in Europe that keeps every school in the land, public or private, within its purview; and also provides some assistance for every school that is at all worthy, whencesoever it originate. Only 0.2 per

cent. of all the children in Denmark are without instruction.

In 1913 the total expense for all the *Folkeskoler* was 7,250,000 kroner (18 kr. = £1) from the taxes, 18,250,000 kr. from the rates, besides 3,500,000 kr. for new buildings from the rates. The instruction of each child costs on an average 83 kr., and in Copenhagen, 130 kr. The town schools have bath-rooms, large playgrounds, well-equipped gymnasiums, school kitchens, with medical inspection and, in some instances, school dentists. In the larger towns, a hot mid-day meal is provided for the poorest children in winter by voluntary subscriptions. In summer, from 15,000 to 20,000 boys and girls from Copenhagen spend four or five weeks with the farmers, free journey by railway and steamboat being provided by the State.

All instruction is free in *Folkeskoler*, and in such of the middle schools or *Mellemskoler* (see below) as the Communes, since 1903, have added as a top storey to the *Folkeskoler* in forty-nine towns. At any rate, there must be free places to the extent of one-third in these schools, and in the one-year *Realklass* (which often forms a rounded termination to the *Mellemskole*).

The compulsory subjects in town schools are Danish (at least 287 school hours a year), Scripture, writing, arithmetic, history, geography, singing, drawing, gymnastics, and sewing (for girls). The optional subjects are natural history, physics, manual work (in wood) for boys, hygiene and cookery for girls, besides algebra, English, and German in some of the *Folkeskoler* and all the *Mellemskoler*. The list is somewhat shorter in the country schools.

All materials (reading books, copy-books, writing and drawing materials, manual work materials, etc.) that are used at school only, have to be provided from the rates; also books that are used at home by the poorer children. In many schools, the last rule has been liberally extended to all children.

The number of school days in the year, both in town and country schools, must not be below 246; the weekly school hours in town not below 21; in the country not below 18—the hours for gymnastics, manual work for boys and girls, and cookery not being included in this number. The number of hours in town schools is generally 24-30 a week in the lower standards, 30-36 in the higher. The town schools have mostly six or seven standards; the rural schools, two, three, or four. Nearly all the rural schools and one-fifth per cent. of the town schools outside Copenhagen are co-educational.

Training Colleges and Teachers. Ninety-one per cent. of the male teachers have been students in training colleges, of which four are State colleges, and twelve or thirteen private, State-recognized colleges. These have, by law, a special claim to all posts in *Folkeskoler* and municipal *Mellemskoler*, both as head masters and assistants, exceptions being sometimes granted by the department. Of the female teachers in the metropolis, 90 per cent., and in the towns 76 per cent., have had the same training as the men; whereas in the country most of the female teachers, who instruct the children below 10 years, have been trained in a college of a simpler kind (*Forskole-seminarium*), designed only for teachers of the lower standards.

Seventy per cent. of the teachers—all the women and more than half the men—are trained in private training colleges, 30 per cent. in public; and the 30 per cent. cost the State three times as much

as the 70 per cent. The course in training colleges—both public and private—is spread over three years, to which it is felt a fourth should be added, in order that some instruction in modern foreign languages may be given. It is terminated by a State leaving-examination—half written, half oral—qualifying for State employment, and conducted in the same way as the two leaving examinations in the secondary school—*Realexamen* and *Studentereksamen*. Many would like to see the instruction in training colleges raised by making it necessary to pass the *Realexamen* or even the *Studentereksamen* prior to entry.

In order to make up for training college deficiencies, there are, at the *Statens Lærerkursus* in Copenhagen, complementary courses in special subjects, short courses for a month, and longer courses for a year. These cost the State about 250,000 kr. a year.

The salaries of the male teachers were, in most of the towns, 1,600 kr., rising at fixed intervals in course of twenty years to 3,000 kr.; of the female teachers, 1,500 kr., rising in the same period to 2,000 kr.; of the head masters, 3,200 kr., rising in twelve years to 4,200 kr. But salaries, in war-time, have had to be increased 70 per cent. or more and women's salaries have been made equal to men's. The initial salary is paid by the municipality, the additions by the State. In smaller towns and in the country, the salaries are a little lower; in Copenhagen and some suburban districts, considerably higher. All assistants have to give thirty-six lessons a week of fifty minutes, with a ten minutes' break between consecutive lessons.

All the elementary schools and the municipal secondary schools are under the control of a committee (*Skolekommission*), consisting generally of three members. The parish clergyman is usually the chairman, and the two other members are chosen (in the country) by the parish council and (in towns) by the municipal council. There are no paid inspectors, except for singing and gymnastics. Denmark has twenty-two counties (*Amt*). The Amt is divided into three or more districts, each of which has a higher committee (*Skoledirektion*), consisting of the Amtmand (sheriff), the Provst (pro-vest or archdeacon), and a member of the county council. All teachers are appointed by this *Skole-direktion*, each from three applicants, picked out of all the applicants by the *Skolekommission* and the parish or town council. Head masters in towns are appointed by the Department.

All *Folkeskole* teachers are entitled to a pension, rising to two-thirds of their final salary. Until 1908, they could be dismissed (by the Department) only for grave offences, complete inability, or serious illness, especially tuberculosis. In the last case they get the highest possible pension. But, since 1908, they may be dismissed by a majority of three-fourths of the *Skolekommission* and the parish or town council, over the head of the Department, if they have got "so far out of touch with their surroundings as teachers that the usefulness of their work is seriously impaired." The words are so vague as to have led to legal decisions which are making the teachers' profession for the moment unpopular; and the teachers are calling for a Court of Appeal.

The elementary school in Denmark presents two noteworthy features seldom—perhaps never—seen in other countries.

1. Such a large proportion of the teachers are

fully trained, that a paid body of inspectors is everywhere, except in the larger towns, dispensed with. The money saved from inspection can thus be spent on training. Prevention is found better than cure.

2. Private schools are found in the elementary as well as in the secondary field; and it may be said, especially of the *Grundtvigian Friskoler*, that they justify their existence by bringing life and freshness into all school work.

Secondary Education. The secondary school in Denmark has its form determined by the law of 1903. It consists of a four years' *Mellemskole*, or Middle School, followed by a three-years' *Gymnasium*. The greatest changes made by the law of 1903 were to bring the secondary school into organic connection with the elementary school, and to make it a school common both to boys and girls. There is no subject taught in the first year of the *Mellemskole* which a well-prepared pupil of 11 or 12 years of age from the elementary school is not ready to undertake. English is begun in the first year, and German in the second. The other subjects are the mother-tongue, religion, mathematics, history and geography, natural science, drawing and writing, Sloyd (one form for boys and another for girls), with gymnastics and singing. The subjects are the same, whatever the ultimate destination of the pupil. No bifurcation takes place until the pupil has passed out of the *Mellemskole*, except that in the fourth year a beginning in Latin may be made by those who are to read Latin in the *Gymnasium* and in French by the rest. The four years end with the *Mellemskole* examination, which is an examination in the previous year's work, and must be passed before proceeding further in the school course. At this stage there are three courses open to the pupil. He may then leave school; or he may take one year more, and prepare for the *Realexamen*, which is necessary for what may be called the minor professions, and is useful for business life; or he may enter the *Gymnasium* and, after three years, pass the *Studentereksamen*, generally called *Examen artium* or *Artium*, which is the only portal to the university and the higher professions. On entering the *Gymnasium*, the pupil has to choose one of three lines, each with a time-table of its own—the classical line with Latin and Greek, the new language line with less Latin and no Greek, or the mathematical and science line. There are forty-five schools which have both *mellemskoler* and *gymnasier*, of which 12 are State schools 2 are well-endowed schools (boarding-schools closely resembling an English "public school"), 5 are communal, and 26 recognized private schools. Eleven of these have all three lines; eleven, only the second; one, a Roman Catholic school, only the first; and the rest, the second and third. The second line (in 1914) had 56 per cent. of the pupils; the third, 36 per cent.; and the first, 8 per cent. Of *Mellemskoler* alone, there are 170, of which 57 per cent. are in private hands and 43 per cent. are communal. There are, in addition, twenty-seven *Realskoler* (all private except five), which prepare for an examination that ranks with the *Realexamen*: these are survivals from an order prior to 1903. The girls' schools in the capital take the *Pigeskole-examen*, which differs only in details from the *Realexamen*. The great majority of the candidates at these examinations have passed through the regular school; but provision is also made for those who have been prepared at home or in courses. These are examined by

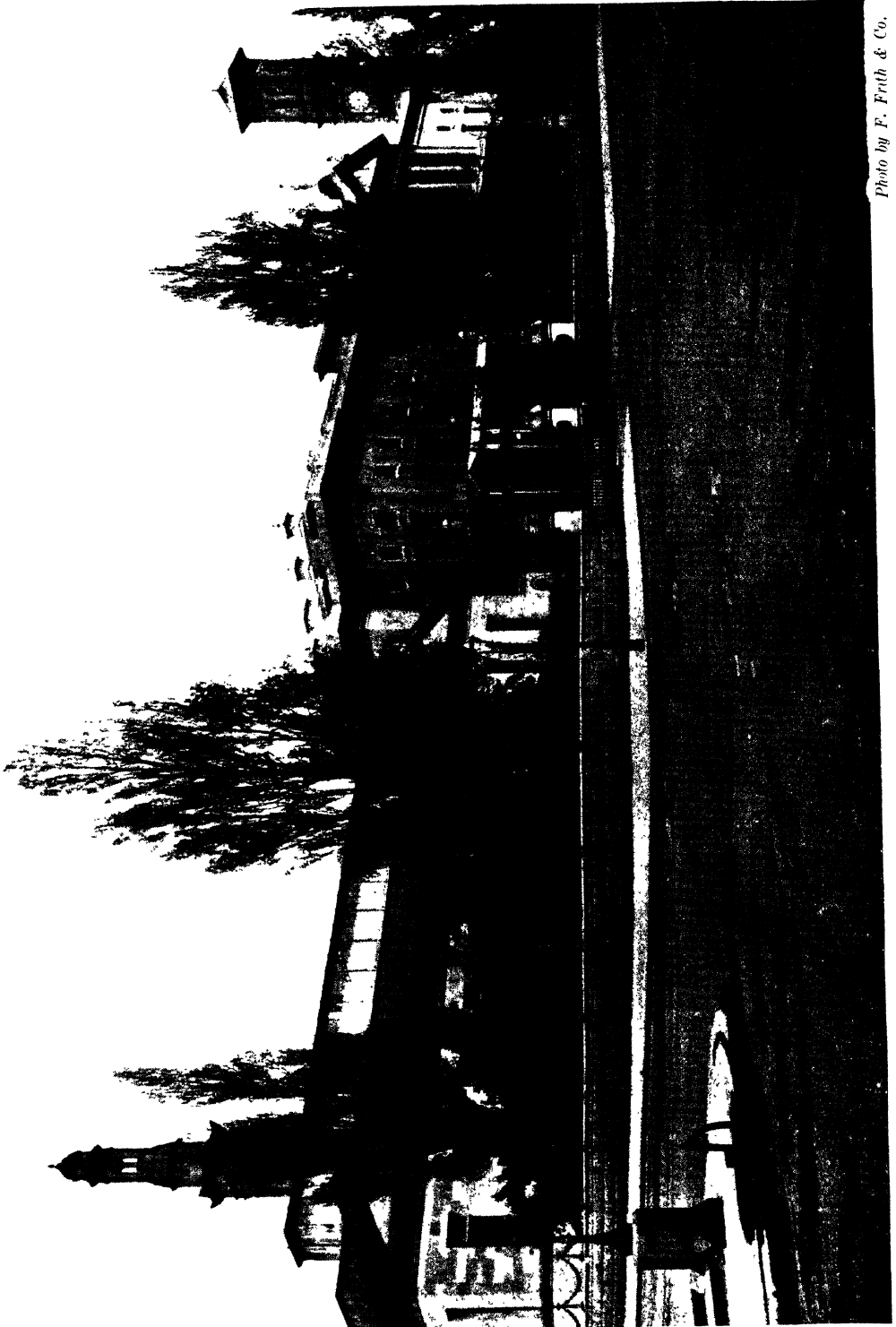


Photo by F. Firth & Co.

University College, Dublin

a specially appointed Commission, and are called Privatists. Of the 865 successful candidates at *Artium* in 1914, one-seventh were Privatists; and of the 3,058 who passed the *Realexamen* or its equivalent, one-ninth. It should be noted that the teachers themselves, under the guidance and in the presence of Government censors (generally leading teachers from other schools), conduct these various examinations; and that quite half of the examination is of an oral character, conducted on a settled plan, bred of long experience. This has its advantages both for teacher and pupil. The teacher is relieved of much of the drudgery of looking over papers; whilst the pupil can more fully bring out what he knows, can trace step by step his success in answering, and is not kept in suspense as to the result. In this way, the chief teachers from State schools, municipal schools, and private schools inspect and adjudge one another's work; and schools of different origin and varying methods become acquainted with one another's ways and affect one another for good. It should be noted that Danish schoolboys, as compared with English, work long hours. Neither in school life nor business life is there any weekly half-holiday. Football, if played at all, has often to be played on Sunday mornings.

The forty-five higher schools and the 170 *Mellemskoler* have each their own special inspector, with an assistant in each case for mathematics and science. The former is responsible for the six months' training course, which in 1908 became necessary in new appointments to the permanent staffs of the forty-five Gymnasias and to headships in the *Mellemskole* (unless, in the latter case, the head master had the leaving certificate from a training college for elementary teachers). There is also a Government inspector for singing and another for gymnastics. This constitutes the whole of the staff of inspectors for secondary schools.

In 1901, nine large State-recognized Gymnasias in the capital, aggregating some 3,000 pupils, formed themselves into a self-governing corporation, controlled by the teachers themselves, the State guaranteeing the interest of the loan that had to be raised to buy out the owners. The result has been a sorely-needed increase in teachers' salaries, the formation of a pension fund, and a contribution from State and commune that had hitherto been denied. The movement has since gone further, so as to embrace also nearly all the private *Mellemskoler* and *Realskoler* in the capital. For further particulars, and also for the way in which State recognition is given and State aid bestowed, reference must be made to the works cited below.

The outstanding feature in these secondary schools not only in Denmark, but in Norway, Sweden, and Finland, is a very important one to which neither the Germans, who have described most things in the school world, nor yet the people in Scandinavia themselves, have drawn special attention. By calling the State-recognized school *private*, people have failed to see that it is just as much public as private, being, in fact, a blend of the best parts of both; and by carrying the recognition to such lengths, a new school-type has been produced, valuable both for its own sake and for its influence in breaking up the rigidity apt to afflict State education. Of all the different secondary school-types, if we take all four countries together, this new type has been more numerous than any; and in the important feature of new experiments and developments, it sometimes surpasses all the rest

put together. This, even more than the undoubted economy in the employment of such an agent, constitutes its chief value. It suffers, as compared with other types, from financial disadvantages, which are obviated by State recognition and (where necessary) by State help, which is always less, and generally very much less, than that given to institutions entirely public. In the soaring war prices of 1918 the large private Gymnasias in and near the capital, being unable to increase salaries sufficiently, were taken over by State or Commune, so that, of the forty-eight Gymnasias in 1920, twenty-eight are State schools, eleven communal, two endowed schools, and seven private.

In 1919, a commission of twenty-five members was appointed to consider the entire school system in Denmark, elementary and secondary, including the training colleges.

University Education. There are, in Copenhagen, three institutions of university rank—the university itself, founded in 1478, with its four colleges: *Regensen* (for 100 students); Borch's, Elers's, and Valkendorf's (for about twenty each, the bulk of the students living at home or in lodgings); the *Polyteknisk Lærestalt* or *Polytechnicum*; and the Agricultural University called the *Landbohøjskole*, with departments for agriculture, horticulture, veterinary science, land-surveying, and forestry.

J. S. T.

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DENOMINATIONAL EDUCATION.—(See RELIGIOUS TEACHING IN STATE-SUPPORTED SCHOOLS.)

DENTAL SCHOOLS.—(See DENTIST, EDUCATION OF A.)

DENTIST, EDUCATION OF A.—The Dentists Act of 1878 placed dental education under the control of the General Medical Council, who keep registers of dental students and of qualified dentists; but the Diploma, Licentiate of Dental Surgery (L.D.S.), after the completion of a prescribed curriculum and various examinations, is granted by the Royal Colleges of Surgeons of England, Edinburgh, and Ireland; by the Faculty of Physicians and Surgeons of Glasgow; and by the Universities of Birmingham, Bristol, Dublin, Durham, Dundee, Leeds, Liverpool, Manchester; and the National University of Ireland, Cork. The Universities also grant the degrees of Bachelor and of Master in Dental Surgery; whilst, in the case of the University of London, those who have obtained the Bachelor in Surgery degree can take the degree of Master in Surgery by passing an examination in dental subjects.

Preliminary Arts Examination. A student, before commencing the study of dentistry, must pass a preliminary examination in Arts, which, if he desires to take a degree, must be the Matriculation Examination of the University granting the degree. For the L.D.S. diplomas, other examinations are accepted, such as the Senior Local Examination of Oxford and of Cambridge, and the special medical preliminary examinations held by the College of Preceptors and the Educational Institute of Scotland. The General Medical Council allow Latin

to be optional in the Matriculation Examinations, but make it compulsory in the lower standard examinations. The College of Surgeons of England do not require Latin to be a compulsory subject. Registration as a student with the General Medical Council is desirable but optional. Particulars of the curricula and the examinations of the examining bodies can be obtained of the dental schools attached to the dental hospitals in the various towns. That of the University of Durham is at Newcastle-on-Tyne; and in London there are four schools, attached respectively to the Royal Dental Hospital, University College, Guy's Hospital, and to the London Hospital.

Courses of Professional Training. Although there are differences in the details of the curricula and in the sequence of the examinations, they all conform to a general type. The curriculum usually extends over four years subsequent to passing the preliminary examination in Arts. Professional study may be commenced by attendance at classes in Chemistry and Physics at a recognized institution, or as the pupil of a registered dental practitioner; but preferably as a student in a dental school. The curriculum includes the study of Dental Mechanics for a period of two years. During the first of these, classes in Chemistry and Physics should be attended, and the Preliminary Science Examination passed; during the second, Biology, as an optional subject, may advantageously be taken and the examination required for a medical qualification passed. If the study of Dental Mechanics be taken in a dental school, lectures on this subject and on Metallurgy are also taken during this period. Pupilage with a private practitioner will, probably, in the course of time, cease to be recognized. The examinations in Dental Mechanics and in Metallurgy are held by the majority of the examining bodies at the end of the second year. The studies of the third and fourth year are in general subjects (which must be taken in a medical school) and in special, or dental subjects, taken at the dental school. The former include general Anatomy (with special reference to the head and neck) with practical dissections, Physiology, Pathology, Surgery (including clinical study), and Medicine; whilst the latter include Anaesthetics, Dental Anatomy, Dental Surgery, Bacteriology, and Practical Dental Surgery.

Examinations. The final examinations are differently arranged. The College of Surgeons of England, which examines the largest number of students, has one examination divided into two parts: first, in the general subjects, which must be passed before the second, in dental subjects, can be taken. But at many provincial universities, Anatomy, both general and dental, is taken at the end of the third year; and Surgery, general and dental, at the end of the fourth. Each examination is partly written and partly oral. In Chemistry, Physics, Dental Mechanics, and in Metallurgy, at the provincial universities, the student is given a practical examination also. In all cases, the examination in Dental Surgery includes operative and clinical Dental Surgery. The education of a dental student has been the subject of endless discussion, and the curricula and examinations are subject to constant modification. Probably the technical and theoretical studies are not even now sufficiently interwoven to ensure that growth in scientific knowledge shall keep pace with, and yet not hamper, the acquisition of technical skill. In

theory, there is much in the argument that all students should take a medical as well as a dental qualification; but, owing to time and expense, this is not possible consistently with the training of a sufficient number of practitioners adequately to meet the public need; *per contra*, many contend that time spent over the purely technical matters of medical work would be better spent on subjects more germane to Dentistry. It is clear, however, that the student should set out to found his knowledge firmly on scientific principles. Thus a knowledge of Chemistry and Physics precedes the study of Anatomy and Physiology; and the broad facts of the latter must be mastered to understand Pathology and Surgery; whilst the general principles of these must be learned before a proper knowledge of the diseases of any particular region can be understood. The teeth and neighbouring parts form no exception to this rule. The ideal education for a dental surgeon should seek to produce a man of culture and professional instincts, for he is brought into close personal contact with his patients, and his advice and operative procedure are matters concerning which they are not competent to form independent judgment. He should have scientific knowledge, that he may help to elucidate the causes of dental disease, for this must precede preventive treatment. He should understand and be able to recognize the general diseases of the body, that he may know whether diseases of the teeth and associated parts are factors in producing these. In the absence of this knowledge, it has happened that an ill-judged operative procedure, perhaps of mechanical excellence, has contributed to the production and not to the prevention of bad health. He must have digital dexterity and gentleness, as his work is often difficult and painful. He should have health that he may not weary in well doing, for his work is tedious and tiring.

W. H. D.

DE QUINCEY, THOMAS (1785-1859).—Was, in 1819, editor of the *Westmorland Gazette*; and, in 1821, a contributor to the *London Magazine*, in which appeared his "Confessions of an English Opium Eater." To *Blackwood's Magazine* he contributed "Murder considered as one of the Fine Arts." He was a great reader and a brilliant essayist, possessing a singular gift of grim and quaint humour. His chief works, apart from his journalistic articles, were a novel, *Klosterheim* (1839), and the *Logic of Political Economy* (1844).

DERBY (LICHFIELD AND SOUTHWELL DIOCESAN) TRAINING COLLEGE FOR WOMEN TEACHERS.—The College was opened in 1851, with accommodation for forty-two students. It has, however, been considerably enlarged, and is now recognized by the Board of Education for one hundred and forty resident students. During the past few years great changes have been made; new practising schools, gymnasium, art room, laboratory, lecture and classrooms, chapel and dining hall having been added.

Considerable attention is paid to the professional side of the work, four method mistresses being on the staff, while all the remaining members of the staff render aid in this connection, for which they have been prepared by training in kindergarten, elementary, secondary, or university colleges. The professional training has, therefore, the advantage of many minds, and varying types of training,

and is less likely to be in any way narrow. Students desirous of becoming specialist teachers, receive every possible consideration, and opportunity for specialist practice. The methods of teaching religious knowledge are carefully dealt with, experimental work having been tried for some years.

In academic work, well qualified students may take the London University Degree course in English and French, and suitable students are encouraged to take a third year in France. The College has taken a large part in the educational movements of the district, as is shown by the large gatherings of teachers which take place from time to time. The recent two days' conference on the teaching of science was attended by nearly 1,000 teachers. The Derby branch of the Froebel Society also holds many of its meetings at the College, to the great advantage of the students, while the Annual Vacation Courses organized by the Principal, attract large numbers, over 500 teachers being present in 1920. The model lessons, demonstrations, and lectures, given each year at the College by experts from different parts of the country, as well as by different members of the staff, and the visits to schools of different types in Derby and other towns, also help greatly in this respect.

Handwork receives considerable attention both for upper and lower school teachers. Physical exercises and sports are in a flourishing condition as they have, for some years, been under the care of teachers from the Physical Training College, Dartford Heath (Bergman-Osterberg).

The entrance fees, payable in two instalments, is £40 for Church Diocesan students, £45 for others.

DESCARTES IN RELATION TO EDUCATION.—

Descartes' views on education were influenced in two directions: on the one hand, by his training in a Jesuit school; and, on the other, by the beliefs which tended to make him break with the teaching of the Schools, and assert the right of man to form his own "clear and distinct" judgments of things. Had he ever written the treatise on Erudition that his royal correspondent, Elizabeth, Princess Palatine, urged him to undertake, one feels sure that his conclusions would have followed the lines of his teaching in his great works.

Views on the Fundamentals of Education. "The end of all study," he says in one of his earliest works, the *Regulæ*, "is to enable us to effect a good judgment." For Descartes the development of intelligence was the real object of education. He is always pointing out that we are not to search for truth in any isolated science or fact, but in a knowledge which is knowledge indeed; and it is in his claim for knowledge that it shall be concrete and living, instead of dead and fruitless, that his teaching is distinguished from the teaching of the Schools. We reach the note of modern philosophy and modern modes of instruction when we come into touch with Descartes' doctrine of the unity of knowledge, and the consequent deduction that the individual fact finds its meaning only when it is regarded in its relationship to the whole. The dullness of the scholastic outlook was just due to the fact that the schoolmen were groping about amongst speculations on subjects which were taken in isolation, and in respect to which there seemed little prospect of arriving at any reasoned certainty. Now Descartes tries to teach us that we must find a basis of certainty, and that, having found it, we must carefully build up our knowledge from

this sure foundation. As we are to start from what is absolutely certain, we can find that starting-point nowhere better than in the principles of geometry and arithmetic. And so he goes on to carry out the principles of what he calls his "Method," which is simply the making certain of each step in a judgment. But Descartes' use of geometry was very different from that of the Schoolmen, who had merely mechanical methods of arriving at their result, and did not use their reason. Descartes' view of mathematics was as of a true science, embracing astronomy, music, optics, mechanics, and everything which seeks to investigate order and measure. And while he comes to the conclusion that truth cannot be sought for in the individual science or fact, but only in the knowledge of the whole, he says that, however we may receive our knowledge, that by which we *know* is spiritual in its nature: in fact, the foundation of our knowledge is in mind or soul.

The Education of the Man. Descartes' own education was a remarkable one, and he loves to dwell upon it, and in spite of his later criticism, point out its merits. He was born just in time to benefit from the educational revival carried out by the Jesuits with such extraordinary vigour and success. In 1604 he was sent to the new college at La Flèche, in Maine, and he remained a student there for eight years. The first five-and-a-half years were devoted to classics, and in the sixth year of his stay he commenced the course of philosophy. René Descartes was immensely influenced by his education. He never ceases in his letters to speak of the love and veneration that he bore to the Fathers who instructed him in youth; just as he felt it a real sorrow to separate himself from them in his beliefs. Descartes tells us the whole course of his studies in the wonderful autobiography which is opened up before us in the *Method*. He tells how he loved the tales of classical lore, and how with poesy he was "in rapture." He warns the reader, however, against the extravagances of Romance, and characteristically upholds the predominance of the faculty of Reason. We cannot but feel that in his later life the literary and artistic sides were somewhat lacking. His range of reading was not wide, though what he did read was read to great purpose; and his literary style is a model of clearness and conciseness. He seldom, if ever, referred to the artistic movement that was at its height in Holland whilst he lived there. One would have expected every sensibility to be called into play by the society with which he was surrounded. But his life was, in fact, a solitary one on the whole, after he had set aside the vanities of youth. Perhaps the most notable part of Descartes' education was not during the long and happy school life with the Jesuit Fathers, or the years when he devoted himself to pleasure. Descartes was one of the few philosophers who were also soldiers, and he took part in the struggle at the beginning of the Thirty Years' War. The young soldier had a detached way of regarding his experiences, and always considered himself in the light of an actor on life's stage. To him, action was not due to the strong impulse of enthusiasm, but to the fact that he would gain experiences that would serve him well in after life. During the time the army was wintering on the Danube, Descartes had great opportunities for study, and his studies culminated in a spiritual experience which we should call conversion. Through it young Descartes

came to a new realization of the meaning of Truth and its value—the truth of Reason rather than that of Revelation, although this mental change had its religious side. From this time, he devoted himself in a new way to the study of Truth.

Contributions to the Theory of Education. Thus, to sum up Descartes' contribution to education we must come back to the point that, above all things, he taught men to have a new estimate of the value of what is true. He does not wish to sweep away all that our inherited learning and civilization have brought to us, but he wants us all to see that our own position is clear—that our own houses are built aright. He speaks of himself thus: "As for the opinions which, up to that time I had embraced, I thought I could not do better than resolve at once to sweep them wholly away, that I might afterwards be in a position to admit either others more correct, or even the same, when they had undergone the scrutiny of Reason. . . . I have never contemplated anything higher than the reformation of my own opinions, basing them on a foundation wholly my own. . . . Opinions depend on many things—the customs of our country, for instance, and the people who surround us. It is reason alone on which true dependance can be placed."

How this attitude has influenced the great educators, we know very well. It never touched the Jesuits, and only in a measure, the teaching of Port Royalists (*q.v.*) But, with the introduction of science as an important part of the curriculum, Descartes' methods had to be adopted. In his scientific work, the value of his system is displayed to its full extent. We may know the world and all that it contains with a definite and accurate knowledge, and thus he maintains even while allowing his speculations to provide him with a theory which apparently gave "clearness," but at the expense of stubborn fact. In any case, we may claim for him the credit of having opened up new visions of what men may search for, or reasonably hope to find. E. S. H.

DESIGN, THE TEACHING OF.—The word "design" was used a century ago with a different meaning from its present use, being equivalent to drawing, the French *dessin*. The association of what we now mean by design with drawing is more or less accidental, although drawing usually forms a part of the process. We mean by design some intention in regard to work, as special arrangement, or an adaptation to meet given ends. Perhaps the best general definition of design in the arts would be—the arrangement of how work should be well done, especially where new adaptations are required. Drawing is a useful aid in recording ideas, but much of the best work has been done directly without it, the design and workmanship being inseparable. In many cases, indeed, the designing of a work and its realization are so closely connected, that it is impossible to separate the two processes. The design of a painting, for instance, is the painting itself; that is, modifications are made in it right up to the end, and the design and work are completed together. We do not, in such a case, think of a design being made by one superior man to be executed by inferior workmen. The closer design and workmanship can be associated the better in every case: for only by being an expert in the work required can any one properly arrange how it shall be done.

The Place of Originality in Design. The work is the reality; designing is but the means; and the first need for the designer for any craft is to know thoroughly the methods and traditions of that craft. We associate originality with design, but original ideas of any value are only likely to come to the designer who knows, and to him they will come more or less spontaneously in solving special problems or reaching desirable ends. Violent and affected distortions to attain the appearance of originality in design are the mistakes of the ignorant. However, much of value leading up to designing in the technical sense may be done by general preliminary training. Indeed, a large part of the best modern education is directed to the object that the student shall, in later life, be apt to arrange how work shall be done: that is, that in a wide sense he should be a designer. In preliminary training for the arts and crafts, we have especially to strengthen and bring out habits of observation; and, above all—and this is not so fully recognized—delight in experimenting. The designer is the explorer, the experimenter, the inventor. His special faculty is to wonder how things would be "like this" or "like that"; and he is not content to take them just as they are. We are, indeed, all designers, and it is the elements of change, experiment, and decision which make games so interesting, for they are experiments in the possibilities of variation. All design springs up, indeed, by variation; and the more it can be taught as a sort of game, so as to keep the pupils alert and interested, the better.

Preliminary Training by Drawing and Painting. Preliminary training for design in the schools will generally be by drawing, but much of value would be gained by the occasional use of other means, such as sets of rods, and coloured cards of varied shape. In drawing, too, the pupils' attention must be directed to the total shape, for in drawing with the pencil he is too likely to fall into the use of a weak and cramped outline. The constant use of a brush is a corrective to this; and, in fact, the brush is the designer's chief tool. Drawing itself would be made much more interesting and valuable if it were taught from the beginning together with design and directed to the end of *work* rather than as an abstract *exercise*. We have thought too much of grammars and subjects, and not enough of obtaining fine skill and forming bold and ready minds. It is a waste to make drawing an exercise in the accurate copying of nothing in particular: while being a drill for the drawing's sake, it should be used as a means of storing the mind of the pupil with valuable material for future use. All copying done in schools should be both an exercise for skill and at the same time a means for the acquisition of knowledge—as fine lettering, some heraldry, forms of flowers and beasts. Such material forms a necessary basis with which to experiment, and is a valuable store for future use. In art schools, all drawings should be regarded as being part of such a collection; and to this end they should, as far as possible, be of the same size and neatly kept together for reference. Life drawing, for instance, should not be a mere exercise, but the making of studies for use. Where students are, or hope to be, associated with any trade, they should be encouraged to make drawings from fine existing specimens of the craft; and so far as possible, small collections of photographs and prints should be got together.

Again, several groups of facts have to be definitely

learnt. Lettering, for instance, is likely to be required by all designers, and good lettering is as easy to learn as bad. All students should, therefore, be taught early to letter in fine style. General ways of pattern distribution also need to be taught, such as sprigs, stripes, zig-zags, nets, scrolls, etc.; and the general rules as to the formation of repeating patterns will be useful to all; also the forms of typical foliage and flowers—vine, oak, rose, honeysuckle, and so on. Flowers should be studied at times in a simplified way by colouring them in two or three tints only. Indeed, a certain amount of simplification both of form and of colour must be practised.

The Experimental Side of Design. In passing to the more experimental side of designing, it should be understood that the observation work and experiment should go forward side by side from the first, and both are endless. What is needed is to form the experimenting habit. Try, for instance, to see what patterns may be built up—

1. By using lines of equal length. This might be tried with a bundle of little rods like matches, and the best results recorded on paper. This opens up the principle of lattice patterns.

2. By taking the chess-board pattern of black-and-white squares as a basis, form more elaborate designs by interlocking the boundaries of the squares, giving up on one side what is taken on the other; or giving up on two opposite sides and overlapping on the other two; or giving up on the half of each side and borrowing on the other half. This is the principle of counter changes.

3. By taking any simple units of form, say oblongs like a visiting card, and seeing what patterns may be formed by various combinations of them. This might be tried with cards of one or more colours.

4. By taking a regular geometrical form, as a triangle, square, or hexagon, as a basis, prolonging each side a little, the lines crossing at the angles. Then bend and curve these lines a step at a time, in a symmetrical way, spreading further and further from the centre, and crossing and turning back where desired. A class of braided and interlacing patterns is thus formed.

5. By taking the types of pattern structure, such as those mentioned above (sprigs, stripes, zig-zags), and experiment in forming variations.

6. By combining well-formed letters of the alphabet into monograms, not distorting the letters, but only arranging the two or three selected in the best possible way.

7. By combining some simplified flower and leaf forms from a study, with the different types of pattern structure obtained as in No. 5.

Such a course can itself be varied to any extent, but it leads directly to the acquisition of confidence and power of initiative which would be beneficial to all who are going to be craftsmen or designers. When, however, a student is already attached to a craft, he may at first be disinclined for any systematic training. The best plan, perhaps, in such a case is to get him to make working drawings from good examples of work in his own craft, say, ironworking or cabinet-making, and then to design by making adaptations from these studies. The more general principles of design should then be brought in by the way as opportunity arises. What we have to aim at is not the rigid application of any rule, nor even the training of model prize-earning students, but rather the forming of competent and resourceful

men. Always remember that design does not necessarily imply decoration—service comes first.
W. R. L.

DESIRE.—(See EFFORT.)

DESKS.—(See EQUIPMENT, SCHOOL.)

DESTITUTE CHILDREN'S DINNER SOCIETY.

—In 1864 the Baroness Meyer de Rothschild commenced, at her own expense, to feed some fifty poor children at the Ragged Schools in Tothill Street, Westminster. In 1866 a committee was formed to extend this work, and the Society was formed with the Rt. Hon. W. Cowper-Temple as Chairman. In the year 1914–1915, twelve dining-rooms were open in the poorest parts of London, and 61,436 dinners were provided. The children pay in pence about one-eighth of the cost, the rest being provided by donors and subscribers.

DETENTION.—A form of punishment which inflicts on pupils a loss of the privilege of freedom and recreation during school intervals and after school hours. Combined with much corporal punishment, detention was very common in elementary and higher schools until quite recent times. The system of "payment by results" led to wholesale detention for the mere purpose of prolonging the hours of work irrespective of the question of punishment. The introduction of a new system relieved the pressure on the teacher, and detention rapidly disappeared from elementary schools. Educationists pressed upon school authorities and on teachers the value of recreative moments, of exercise and fresh air; and now detention is rare and, when inflicted, is a simple punishment unaccompanied by work.

DEVELOPMENT, PHYSICAL AND MENTAL.

—That there is a close relationship between physical and mental development has been shown by the results of various researches on the subject. The cells of the brain centres fail to develop unless the organs with which they are connected are given full play. This has been proved experimentally. If the eyelids of a new-born kitten be sewn down, it is found that there is an arrest in the development of the visual centres.

In the higher animals, many of the brain centres are rudimentary at birth, and develop during youth. This development is probably brought about by means of play, each species tending towards a type of play which specially fits it for its future work.

Amongst children, much work has been done in comparing the relative standards of physical growth and brain development. One of the most comprehensive records is that given by Professor Mark Baldwin in his book *Physical Growth and School Progress: A Study in Experimental Education*. Professor Baldwin deals with children between the ages of 4 and 18, and investigates the relationship between the physical records and the school progress. He finds that the physiological maturity of larger children is attained earlier than that of smaller ones, and that accelerated growth is correlated with success in school work. These conclusions have been drawn from very reliable data, and show that there is a very close connection between height, weight, physiological maturity, and school standing. (See U.S. BUREAU OF EDUCATION; *Bulletin*, 1914, No. 10; Washington Government Printing Office.)
M. J. R.

DEVICES FOR TEACHING.—Probably the oldest device in the world by which facts might be taught was to embody the subject-matter in rhyme or verse, and to require pupils to learn it. The Druids, who were the teachers of our early forefathers, fashioned their "law and prophets" into rude verse, which the chosen ones learned by heart. Then there were the Bards, who were the historians, musicians, and poets, as well as teachers. They sang of war, heroic deeds, the slaying of monsters, of love, and of glory. The verse aided the memory; and in the days when written documents were priceless possessions and few people could read, this form of preserving records was necessary. All kinds of material, including the Psalms, the Latin Grammar, and the *Whole Duty of a Child*, were considered suitable for children to learn in the schools of the Middle Ages, and, later, were put into rhyme to be learnt by heart.

Much quaint worldly wisdom is to be found in the old rhymed books of behaviour; e.g.—

"And, child, rise betimes and go to
School,
And fare not as a wanton fool,
And learn as fast as thou may and can,
For our bishop is an aged man;
And therefore thou must learn fast
If thou would'st be bishop when he is
past."

(*The Whole Duty of a Child.*)

Rhymed alphabets were in use before the introduction of printing. In the *Babee's Book* is an alliterative poem known as the A B C of Aristotle; and rhymes such as—

"A, apple pye; B, bit it;
C, cut it; D, dealt it"

and—

"A was an Archer and shot at a frog,
B was a Butcher and kept a big dog"

come down to the nursery through centuries. Rhymed Latin and English grammars, rhymed outlines of history and geography were not uncommon during the nineteenth century. The antiquity and universality of the device of putting information into rhyme are a sufficient proof of its value in aiding mechanical memory. How many, even now, depend on the old rhyme—

"Thirty days hath September," etc.

Dialogue. The use of dialogue as a means of simplifying instruction, and causing the pupil to learn by rote, is also very old. Before the introduction of printing, learning by heart was essential; and in employing both rhyme and dialogue, the mature mind put the facts to be learned in convenient and precise form. The Church Catechism is a good example of learning in the form of dialogue. Anselm's *Elucidarium* is an example of an early book of this type; while the *Child's Guide to Knowledge*, largely used during the nineteenth century, may serve as a later example. Elementary treatises, in the form of questions and answers, on grammar, geography, general information, and historical incidents form a feature of the school books early in the nineteenth century (e.g. *Magnall's Questions*, Dr. Brewer's *Guide to English History*, and *Guide to Roman History*). The method had features to recommend it. The young child learnt

exact *précis* of information, though often the meaning was obscure; yet the words remained as a lifelong possession, the meaning coming in riper years. In older educational methods, an attempt was made to store the mind with information at its most retentive period, but, nowadays, learning by heart has fallen into discredit.

Fable, Parable, and Allegory. Teaching by means of allegory, fable, and parable is of great antiquity. Plato would teach little children by means of fables, for they are, as yet, too tender to look upon truth unveiled. Imagery and allegory were employed largely in Oriental countries. The teachings of the New Testament owe much to the power of parable. The monks, who were often admirable teachers and knew human nature, used to dress up the popular romances and stories of the day in religious garb, in order to make their instruction attractive; and, after an enthralling story, a symbolic truth would be appended thus: "My beloved, the Emperor is God, the palace is the human heart, the Knight is Christ, the Spirit is faith"; and so on. Æsop's fables were used in school books from early times, and Bunyan's *Pilgrim's Progress* was one of the most popular of children's books. This method of teaching touches human nature, and goes deeper than the superficial aids of verse and dialogue.

The Use of Pictures. The device of making learning acceptable by pictures is not new. Comenius (q.v.) in his *Orbis Pictus* (1657), says: "The foundation of all learning consists in representing clearly to the senses sensible objects, so that they can be apprehended easily." Rousseau and Pestalozzi developed this idea. Teaching by pictures has been one of the useful devices for making learning attractive, since printing made pictures possible in the schoolroom. We find Madame de Genlis devising an ingenious and intelligent system of instructing the royal Orleans children. She employed a skilful artist to paint, on the walls of a gallery, pictures representing sacred and secular scenes, by means of which she familiarized her pupils with history. She also made them act historical scenes in a little garden theatre.

Play. The method of teaching by means of play is very old. Plato praised the Egyptians for teaching Arithmetic by means of games; and Erasmus admired the ingenuity of the Ancients for moulding toothsome dainties in the form of the letters of the alphabet. Quintilian recommended an alphabet in ivory, which children may find pleasure "in seeing, handling, and naming." Rabelais caused his pupil to play cards and learn "a thousand pretty tricks all grounded on Arithmetic"; and Locke advised that children should play with ivory balls upon which the letters of the alphabet were pasted. Though Plato had said "Education must begin in the games of children," to Fröbel belongs the praise of putting this into universal practice. Perhaps the greatest educational development of the nineteenth century was the general recognition that the little child is to be educated through play and self-activity; that his interests and needs are to be considered; and that "work under the garb of pleasure" is a healthy exercise and encourages vitality.

C. I. D.

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The Babee's Book.

DIALECTIC.—Relating to the art of reasoning or disputation; also logic or a branch of logic. The invention of the term is attributed to Zeno, whose arguments against motion illustrate its original meaning. The dialectic of Socrates and Plato was a conversational discussion with inductive appeals to special instances. Aristotle limited it to logic accommodated to the use of the rhetorician. In early English literature, the word was synonymous with logic, but with a suggestion of disputation. (See ARTS, THE SEVEN LIBERAL.)

DIALECTS AND EDUCATION.—In the mouth of the common people, no language is spoken in exactly the same way over the area of its use. Different varieties of French are heard in Rouen, Paris, and Marseilles; the Spanish of Catalonia is very different from that of Castile; and English varies almost from one county to another. So long as these different forms of a language are intelligible to one other, they are called dialects. When mutual intelligibility ceases, they are regarded as distinct languages. French, Spanish, Italian, now separate languages, were originally dialects of the popular Latin of the Roman Empire. On the other hand, the English dialects have not yet so far diverged as to be mutually unintelligible.

Standard Languages. In the history of most languages, it will generally be found that one of those dialects takes the place of all the others as a common means of communication for the whole nation. Thus, in England, the East Midland dialect has become the standard form of speech for polite intercourse, for commerce, and for literature; in France it is Parisian French, and in Spain, the dialect of Castile. This standard is also the medium of instruction in the schools; ability to use it is one of the first qualifications for citizenship, and the study of its literature the most obvious and important means of culture. In the general scheme of education, it may be asked, have the other dialects any share?

Every dialect which is the result of natural growth contains in it something of the life and character of the people who speak it. Hence their thoughts and feelings can be best expressed in their mother speech. All our dialect writers have realized this fact, and probably many of them would never have attempted to write had they been forced to use the standard language. In this event, the loss to the general community would have been considerable, for it is often through dialect literature that the different parts of a country have come to understand local customs and habits of thought, and to sympathize with local aspirations. The social and political influence of dialect literature ought not to be underestimated.

Literary Influence of Dialects. To the standard literature, also, dialect works often give a new impulse and inspiration by presenting unusual types of character and unconventional views of life. Proof of this may be had in the influence of Scottish vernacular literature on our modern English novelists and poets.

The popular idea that a dialect is a vulgar and corrupt form of the standard language is true, in any measure, only of the mixed speech of our large industrial centres. The dialect of the smaller towns and the countryside is generally the descendant of a form of speech that was once on an equal footing with the dialect from which the standard language takes its origin. For instance, in the days of

Chaucer, we find, in England, three main dialects—Northern, Midland, and Southern—each having its own literature, and each used as a medium of social intercourse. As the East Midland gradually assumed the premier place, the other dialects (with one exception) ceased for centuries to produce a literature of their own. On the other side of the Tweed, however, the Northern dialect of English, being now the national speech of Scotland, continued till 1603 the literary tradition of Anglian speech. After 1603, Midland English gradually took its place as the literary medium of educated Scotland, but the old language is still in common use over the country, and is still able to represent in literature many aspects of national life. This it does in verse and song, in the short story, in the character-sketch, in the dialogue in novels, and, latterly, also in the rustic drama.

Most of the other English dialects within the last hundred years have undergone some degree of literary revival; and a few, as in the case of the Yorkshire and Lancashire dialects, have developed a considerable dialect literature. Modern English novelists have also followed the example of Scottish writers in introducing dialect speech to give local colour to the characters in their novels. Influenced, however, by the grammar and idiom of the standard language, they often make mistakes which an intelligent training at school would have enabled them to avoid. On the other hand, by their works they have popularized expressive dialect words and phrases, and restored to the literary speech many old words which it had lost.

Scientific Value of the Study of Dialects. These regional dialects have for some time now engaged the attention of philologists, and the study of their grammar, vocabulary, and pronunciation has thrown light on past phases of the language and the general development of speech. The scientific description of a humble dialect may be to a university student an excellent training in practical philology. Even in the schools, a scientific training is involved in tracing out the distinctions in grammar, in pronunciation, and in the meanings of words between the standard and dialect forms. Teachers interested in these points ought to consult the *English Dialect Dictionary*, edited by Dr. Wright; and Vol. V of Dr. Ellis's monumental work on *Early English Pronunciation*.

Some of the editors of school books have realized the importance of the local ballad and song, and have incorporated a few of these in their recent editions. In Scotland, selections of Scottish Readings in prose and verse have already been published for school use (e.g. *Scottish Poetry for the Young*, edited by Dr. W. A. Craigie; *Readings in Modern Scots*, edited by A. Mackie; *Extracts from Scott's Novels* edited by J. K. Craigie).

The Yorkshire Dialect Society has quite recently produced a collection of Yorkshire Dialect Poems from 1673 to 1915, edited by the late Professor Moreman, of Leeds University, which might be used for school purposes. Where no such collection has been published, the head master of the school should make a suitable selection from the literature of his district. A certain number of poems or songs or prose readings should be assigned to each year of the school course, so that the absorption of time in any year would be a negligible quantity. The extracts could be typed for the use of the pupils or merely written on the blackboard to be copied by the class. Any teacher with local knowledge and

enthusiasm could make the reading of these extracts intensely interesting; and by linking them with other subjects, such as local history, geography, and industry, impart also a great deal of useful information. In the higher classes of the secondary school, the reading of modern dialect would lead easily to the literature of the older stages of the language. Thus Scottish, Modern Yorkshire, and Northumberland speech take us back to *Cursor Mundi* (c. 1300), to the *Pricke of Conscience* by Richard Rolle of Hampole (c. 1340), and to *Barbour's Bruce* (c. 1375). The dialects of Somerset and Devonshire go back to the Southern English of Layamon's *Brut* (c. 1309), and to Robert of Gloucester's *Chronicle* (c. 1300), whence the transition to the West Saxon of King Alfred is comparatively easy.

Objections to the Study of Dialect in Schools. Many teachers object to the use of dialect in school, because it distracts the pupils in their attempt to master standard English. To prevent confusion in the minds of their scholars between the grammar and pronunciation of the standard and of the dialect, teachers deliberately ignore the dialect, if they do not actually denounce it as barbarous and vulgar. This attitude will never be changed till the Board of Education insists that every teacher in the elementary school and all teachers of English in secondary schools shall have a thorough knowledge of the history of their own language and of its chief varieties, and have also a sufficient phonetic training. Teachers could then take an intelligent interest in the language of their district and add very much to the enjoyment of their lessons. Having an ear trained to the distinctions of sounds, they could show more clearly to the children the differences in pronunciation between the standard and the dialect and by constant contrast impress them on their pupils' memories.

One further reform urgently demanded in our schools is the training of the hearing and utterance of the children in the speech-sounds of their own language. This should begin in the infant room, when the imitative powers of the child are still very strong and the ear very keen to the appreciation of sound. This early training has a very direct and important bearing on the teaching of the English language and of reading all through the school life, and on the teaching of modern languages in the secondary school. What concerns us chiefly now, however, is that it would enable the pupils to appreciate easily the distinctions between the sounds of dialect and standard pronunciation and to imitate them correctly, thus removing the most common objection to the use of dialect in our elementary schools.

W. GRANT.

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DIALECTS, OR VARIETIES OF PRESENT-DAY ENGLISH.

—The first thing that strikes even an untrained observer who compares the speech of several individuals, and still more that of a group of individuals with that of another group, is a more or less marked variety or divergence between them, in pronunciation, in vocabulary, in grammatical forms, and the construction of sentences. Here we are in the presence of a very vital fact in the life of language, namely, the existence of varieties, or *Dialects*. If we inquire into the meaning of this, we get to close quarters with a very important question.

It is noteworthy that persons belonging to the same class, who have the same degree and kind of education, or who come from the same part of the country, generally speak alike. The differences which we observe in the speech of our contemporaries are the speech habits which characterize this or that geographical area, or this or that class of society. We may divide dialects into *Regional Dialects*, which are the result of geographical factors; and *Class Dialects*, which arise from causes connected with social grouping. Among *Class Dialects* we can distinguish *Standard English* (better called *Received Standard*) and *Vulgarisms*, which are usually offshoots, spoken among certain sections of the community, of Standard English. These may, therefore, often be described as *Modified Standard*.

The study of the vagaries of contemporary English, while it is amusing, is also very necessary, because Standard English itself is now a class dialect, gradually evolved from a mixture of regional dialects, and variously influenced from century to century, not only by external regional dialects, but also, from time to time, by various class dialects, which sprang from Standard English at an earlier period. The result of these facts is that what is a Vulgarism with one generation is part of the Received Standard of a later day, and what one age considers highly fashionable and polite, may be deemed, by that which follows, an unpardonable Vulgarism. Unless this be understood, it is impossible to explain many changes which have overtaken Standard and Literary English, changes which are of the nature, not of normal evolution of sound or grammatical form, but of the abandonment of one existing type of pronunciation, and the adoption of another.

[The study of the more colloquial languages of the sixteenth century, as seen, for instance, in Ellis's *Original Letters*, is very instructive as showing the gradual development of standard-spoken English.]

The So-called "Mistakes" in Grammar of Children and of Uneducated People. This branch of observation in contemporary speech is within the reach of all, and it is full of instruction if approached in the proper way. It is important to know that what we call "mistakes," whether in the speech of an individual, or in that of a whole community, like everything which occurs in human language, have always a perfectly good reason. First of all, we should note that by a "mistake" we merely mean something which is different from the Received Standard English of our age. Judged from this point of view, it is clearly "wrong" to say: "I give 'e a good beatin' yesterday." We should, perhaps, say, *gave* and *him*. Similarly, if a very little child talks of *tooths*, *mouses*, we "correct" it, and in time it adopts our forms of these words.

Why do some regional dialects use *give* as the past tense of the verb, and *'e* instead of *him* in the Dative? Simply because the speaker uses a different pattern or *analogy* from that usual in Standard English. The mistakes of the child are clearly due to the same cause. He uses the analogy of the few dozen or so words which he knows, which do form their plurals with the suffix *-s*. This used to be called "false analogy," but since it is now recognized that the process itself is absolutely the same whether it lead to what we call a "wrong" form, or to what we call a "right" one, we leave out the epithet, and simply say that certain speakers have *different* association from ours, that they use a

different analogy. The instructive thing for the student of language is to discover the starting-point, the particular analogy which has led to the "mistake." This principle of analogy, which is ever at work in speech, has led to some tremendous changes in grammatical usage in English, and, together with sound change, has been a most potent factor in shaping our language. The subject must be studied by the teacher in the proper books, but we may point out here that, thanks to the fact that we start, in many respects, from different groups of grammatical associations from those of our ancestors, we now use *books* as a plural instead of the historical *beech*; we make *help* a weak verb and say *helped* in the past participle, instead of *holpen* (still used in the *Magnificat*); we use *you*, originally a dative plural, as a nominative singular. These examples are taken at random from thousands of similar instances. If we compare our present-day grammatical forms, usual in Standard English, with those of the fourteenth century; and, still more so, if we compare them with those of King Alfred's time, we shall discover that for centuries, English speech has been getting more and more "ungrammatical" and "incorrect." We shall also find that many of the regional dialects retain grammatical forms which, although at the first hearing, and from an ignorant point of view, we call them "wrong," are, in reality, historically more primitive and "correct" than our own! Indeed, the popular ideas as to what is "right" and what is "wrong" in speech are vague and unsound. The truth is that, whatever is habitual at a given time in a given dialect is *right*, in that dialect, at that moment; whatever is strange and alien to that dialect is "wrong," so far as that dialect is concerned.

Thus, the observation of the "mistakes" of "uneducated" speakers of regional dialects is of the utmost value and importance, both because these forms of English provide such ample instances of the all-important effects of *analogy*, and also because they often preserve primitive usages which Received Standard English has long abandoned.

The teacher should encourage his pupils to collect instances of "mistakes" from very young children, and from speakers of regional dialect. He should explain the principle of analogy, and try to make the pupils discover what was the starting-point, or model, or analogy to which each "mistake" owes its existence. Where this is a survival of an earlier form, given up by Standard English, he should point this out, and explain by what analogy the modern Standard form arose.

It is perhaps now apparent that the intelligent and enlightened use of such materials as lie ready to hand in the spoken English of the child himself and of the persons with whom he is bound to come in contact, form an introduction to the study of the history of English, from which can be learnt: (1) Something of the nature of speech sounds; (2) the tendency among individual speakers to alter sounds (a) according to degrees of stress, (b) according to the nature of neighbouring sounds; (3) the existence of considerable variety in speech habit, according (a) to geographical situation, (b) according to social divisions; (4) the nature of analogy and its importance in the study of language; (5) the fact that there is no absolute standard of right and wrong in language, but that this may and does vary from age to age, and from dialect to dialect.

H. C. W.

DIALLING.—The making of sun-dials was an important branch of mathematical study in the days before clocks and watches were in general use, and the sun-dial was then the usual time-keeper. A dial consists of a *style* or *gnomon*, made parallel to the earth's axis and pointing towards the North Pole; and a *dial-plate* on which are marked the directions of the shadow of the style, with numbers to indicate hours and parts of hours. The construction of a dial involves the process of ascertaining where the hour-lines cut a given circle, which in different kinds of dials may be in different planes. The usual planes are horizontal, vertical, and parallel to the equinoctial plane. If a hollow, transparent sphere represent the earth, with twenty-four meridians marked on the surface, and having an opaque axis, inclined to represent the earth's axis, and if a horizontal dial-plate make a section through the centre of the sphere, the shadow of the opaque axis as it falls on each meridian in the course of the day will show the time (at London, for instance) when the sun is over the meridian. The dial-plate would represent the horizon of London, and each hour-line on it would correspond with a meridian on the sphere.

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DIALOGUE AS AN EDUCATIONAL AID.—(See DEVICES FOR TEACHING.)

DICK BEQUEST, THE.—James Dick, a Morayshire "loon," born in 1783, bequeathed at his death, in 1828, the bulk of his fortune for the benefit of parochial schoolmasters in the counties of Aberdeen, Banff, and Moray. When the Trust became operative in 1833, the capital amounted to £113,000, and, by 1844, had increased to £118,000. The interest has fluctuated between £3,300 and £6,000, being in 1833 £3,600 and, in 1919, £5,600. The trustees were, in the first instance, selected from the Writers to the Signet in Edinburgh; but, by the new scheme of 1890, representation was given to the University of Aberdeen and to certain groups of school boards in the area of the Trust.

The first secretary and visitor of schools was Professor Allan Menzies, who was succeeded by Professor Laurie (1856-1907).

The special objects of the testator were "to encourage active schoolmasters, and gradually to elevate the literary character of the parochial schoolmasters and schools." One hundred and thirty-seven schools were found eligible for grants; and the trustees, after careful consideration, resolved to adopt as principles of distribution the number and attendance of scholars, school fees and gratis scholars, salary of teacher, his merit, the higher branches taught. Care was from the outset taken that grants should not be in lieu of, but in addition to, due provision by the school managers, for which, therefore, minimum requirements as to salary, etc., were laid down. The teacher, in his turn, had to submit himself to examination before being admitted as a beneficiary. The standard was so exacting that it was no uncommon thing for university graduates to fail at their first attempt. The higher branches were specified as English grammar—at least for the time being—geography, mathematics, Latin, Greek, French, etc. The history of the Trust has largely centred round the

position of these advanced subjects, their effect on the general work of the school, and the influence of the school through them. The trustees have from time to time claimed that to keep the teacher, particularly the rural teacher, in touch with the more liberal studies, has an admirable influence on the whole instruction. Besides, when the school becomes the outlet for struggling ambition in the humbler ranks, contentment is promoted in the community, and at the same time the nation is benefited. As the grants were in addition to average salaries, a better class of teacher was secured in the three countries than elsewhere.

The Trust is an admirable illustration of the benefit of local educational endowment and effort, at a time when education was a voluntary concern.

The reports of Menzies and Laurie, issued for the most part decennially, are admirable reviews of existing educational conditions and movements both in the North and all over Scotland, and have a permanent value quite independent of their immediate purpose.

With the development of public education, first elementary (1872) and, later (1890-1918), higher, the necessity for such a bequest was greatly lessened. The Code "specific" subjects were largely the (Dick) higher branches. Laurie became rather impatient of what seemed to him encroachment on his domain, if not also wrongmindedness; and in his (Special) Report in 1904, when fresh legislation was imminent, gives expression to his dissatisfaction with the outlook.

Recent reports have been merely business and statistical statements by the secretary, Mr. J. H. Bayley. The late Dr. William Dey succeeded Laurie as visitor. The present visitor is Mr. R. T. Skinner.

The improvement in the training and certification of teachers has rendered superfluous the examination of beneficiaries, which has been discontinued. The grants have varied somewhat according to circumstances, but the average may be set down at £30 or thereabouts. In 1919 the average amount was just on £44.

J. CLARKE.

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DICKENS, AS EDUCATIONAL REFORMER, CHARLES.—In the elastic sense of the word, Charles Dickens discovered the childhood of England. He found it lying bruised, battered, and bleeding on the highways of social life. The memories of his own early struggles, and neglected upbringing, fired him with a passionate zeal to redress its wrongs and to heal its wounds; whilst the prevailing cynical indifference to the training of children evoked in him a resentful wrath.

The problem which Dickens had to face in his day was a threefold one. A large proportion of the children of the time was being daily swept into crime because of their total neglect; another class was being exposed to almost unthinkable miseries in the dark hells masquerading as educational establishments; and there was a third class, to whom education was being doled out, without physical horrors it is true, but upon a plan which dwarfed the mind and atrophied the imagination. Dickens's task was to destroy all three, and he essayed it with an exultant energy that carried all before it.

In his assault upon the first of these evils, Dickens insisted again and again that Society, by failing to educate the young, was in reality breeding criminals. In article after article he directed attention to the prison tables, to the statistics of crime, and showed how a large percentage of criminals were unable even to read or write.

As a result of one inquiry, he found that only 150 out of 11,000 were so equipped. His clarion voice rang through the land: "Side by side with crime, disease, and misery in England, ignorance is always certain to be found. . . ." He penned vivid word-pictures of starving juvenile offenders, standing in the dock charged with theft, utterly uneducated and entirely without guidance, sentenced to be whipped; and he was wont to break out in indignant lamentations: "Woe, woe! can the State devise no better sentence for its little children? Will it never sentence them to be taught?"

The Yorkshire Schools. The Preface to *Nicholas Nickleby* chronicles his resolute determination, now that *Pickwick* had brought all the world at his feet, to end once and for all the second evil which he found flourishing in what may be called the Yorkshire schools. In a few inspired chapters, he exposed ruthlessly the terrors and the tragedies of Dotheboys Hall. With a remorselessness and a truth that there was no gainsaying, he portrayed for his age the spectacle of: "Pale and haggard faces, lank and bony figures, children with the countenances of old men, deformities with irons upon their limbs, boys of stunted growth, and others whose long meagre legs would hardly bear their stooping bodies, all crowded on the view together; there was the bleared eye, the hare-lip, the crooked foot, and every ugliness or distortion that told of unnatural aversion conceived by parents for their offspring, or of young lives which, from the earliest dawn of infancy, had been one horrible endurance of cruelty and neglect."

Once seen, those horrors became impossible. In a very special sense the Yorkshire schools "broke up" for ever. The Squeers and the Creakles were doomed. The system which subjected children to be taught by half-starved and under-paid ushers employed by "ignorant, sordid, brutal men" received its quietus. Copperfield and Nickleby brought it home that a schoolmaster, no less than a carpenter, required special training and special qualifications, and accordingly the demand for certified teachers became loud and insistent.

Cramming. With the overthrow of the "Yorkshire Schools," another evil was manifest. The exit of Squeers gave us the emergence, if not the advent, of Blimber. From being so hopelessly careless and slipshod in their methods that none of their pupils learnt anything, schools became so severely mechanical and highly organized with a view of teaching all of them everything, that they were found to be, in practice, even a greater failure.

The cruel old system repressed the spontaneity and free play of child-life; the new subjected the children to so severe and so merciless a *régime* as to produce results little better than the brutalities they had superseded, and upon this also Dickens turned his satire. In *Dombey & Son* he held up cramming to the scorn of the world. The intellectual "hot-house" of Dr. Blimber became a jest and a bye-word.

Constructive Ideas. Dickens's constructive educational philosophy can be summed up in that pregnant phrase of his which proclaims: "It is a crime against a child to rob it of its childhood." In that

sentence he has expressed for us all that a century of educational reformers, since Froebel, have been striving to make clear. Dickens studied Froebel with the utmost care. Mrs. Pipchin's theory of a child's mind was "to open it by force like an oyster"; her creator's theory was that it was right "to encourage a child's mind to develop and expand itself like a young flower." Dickens it was who first taught us the paramount necessity of vivid personal sympathy between pupil and teacher, without which lessons become, as they did to David Copperfield, "a grievous daily drudgery and misery." Dickens's pages are plentifully bestrewn with portraits of born teachers—men and women who we realize bring to their task sympathy and understanding affection. Beyond this, he pleaded always for the cultivation of imagination in children. He held that we must always cherish "that flight of fancy which is inherent in the human breast," and he insisted that all education was waste unless it cultivated "those imaginative graces and delights without which the heart of infancy will wither up, the sturdiest physical manhood will be morally struck dead, and the plainest national prosperity figures can show will be but the writing on the wall."

W. W. C.

DICTATION.—This is employed as an indirect method of teaching spelling, while it teaches composition directly. It is not, properly speaking, a test of spelling only, and should never be employed for the sole purpose of discovering errors in spelling. It is most usefully employed in connection with composition and when accuracy of spelling is not put forward as the only object aimed at. It is more useful for a learner to be able to write down an intelligible group of words, such as "Under the spreading chestnut tree," without omissions or substitutions than to write singly each of the five words correctly. If employed as part of a course of teaching, dictation is associated with both reading and spelling. The passage dictated should usually be one that has become more or less familiar to the children and is suitable to their capabilities. The correction of errors is made a guide for the pupils' future use.

DICTIONARIES.—More plainly than any other class of books, dictionaries owe their origin and usefulness to the limitations of the human memory and the imperfections of individual knowledge. They are, in fact, indexes of a superior kind, in which are arranged in alphabetical order the verbal symbols of a multitude of facts and ideas, so that both the forgotten and the unknown may be readily found by turning up the relevant word. On the knowledge and skill with which an adequate explanation has been given to the word, or some useful comment added, depends the educational value of the dictionary itself; as much or more will obviously depend on the ability of the user to profit by the information supplied.

Of dictionaries in common use, there are two distinct kinds. In one of these a single language is employed as the medium of information, the explanations being given in the same tongue as that to which the word explained belongs. In the other type, the entries are equated with, or explained in, words belonging to a different language or languages. The origins of both types lie far back in the history of European learning and education. The first naturally arose among the

Greeks, whose rich literature, with its long history and marked dialectal variations, gradually accumulated a large stock of words not in common use in later times. The need for some ready means of interpreting these words was eventually felt by students and teachers, and gave rise to collections of glosses which finally developed into such works as the lexicons of Hesychius and Suidas. A similar need arose with respect to Latin when this had become the learned tongue of Western Europe; and extensive collections of unusual words, with explanations in simpler terms, were made at various times and in different countries. That such collections were largely used by teachers, if not directly by pupils, is quite clear, and the method followed in compiling them from glossed texts is also plainly apparent. These glossaries are the prototypes of our modern unilingual dictionaries, which at the outset agree with them in being entirely collections of "hard words." The educational motive is obviously the same in both cases: to provide the information required by a quicker and surer method than dependence on oral instruction.

The second type is the natural result of an endeavour by one people to learn the language of another by the aid of writing. Those Romans who studied Greek must soon have discovered the usefulness of lists of Greek words with their Latin equivalents, and at a later date the same method was naturally followed by those who had to acquire a knowledge of Latin. As soon as these lists were arranged on an alphabetic basis (however defective), the idea of the bilingual dictionary was created, and many extensive specimens of such lists have come down from the later Middle Ages. Subsequently it was found equally useful for purposes of instruction and study to have alphabetical collections in which the native word came first and was followed by the Latin equivalent.

From these models have arisen, by degrees, all the dictionaries in which two or more languages are mutually equated or explained; excellent specimens of these are frequent from the sixteenth century, and some date even from the middle of the fifteenth.

Use in the Study of a Foreign Language. It is obvious that as regards their use in education, these two main types of dictionaries are complementary to each other. From the one, the pupil or student improves his knowledge of his own language; from the other, he acquires much of his knowledge of any other tongue he may chance to study. For the proper acquisition of a foreign or ancient language, the use of a dictionary is not only natural, but practically indispensable, as without such aid the learner must either have constant oral instruction, or be reduced to inferring the meaning of new words from the contexts in which he finds them. It does not follow, however, that a dictionary is the best help at all stages of learning another tongue; improperly and prematurely used, it may even be a serious hindrance. At the outset, the quickest method of becoming familiar with a considerable number of words is from the exercises in a good grammar, and the lessons in a good reading-book provided with proper vocabularies. At this stage, the time spent in finding a word in a dictionary, and selecting the appropriate sense, is out of all proportion to the result, as well as a frequent source of error. Insistence on the early use of a dictionary also leads to slowness in reading, and

is apt to create a sense of drudgery which is detrimental to the pupil's interest in the subject. The proper time for using the dictionary comes when a fair stock of usual words has been acquired, so that occasions for consulting it are not too frequent. To begin with, a dictionary of moderate size is best, as being likely to give only such information as is really useful at this stage. On the other hand, very small dictionaries are frequently unsatisfactory through omission of the rarer words and even of essential details (such as the gender of nouns), or failure to distinguish between entirely different words which happen to have the same form.

As soon as it can be done with profit, the use of a dictionary entirely written in the foreign tongue is to be recommended, as helping greatly towards a knowledge of synonyms and of shades of meaning. Finally, for a full and scholarly knowledge of the language, recourse must be had to the standard dictionaries, in which the rarer vocables are more likely to be recorded and properly explained than in smaller works, and where the articles on common words make some approach to completeness in the treatment of senses and idioms. Where more than one such dictionary exists, there are usually some points in which one is more useful or authoritative than another. The student of French, for example, will naturally turn to Littré for information regarding the senses, inflections, or status of a word; but will consult Hatsfeld-Darmsteter on questions of date and etymology, and, if interested in the older stages of the language, will supplement both by referring to the pages of Godefroy.

Use in the Study of One's Own Language. The use of a dictionary of one's own language naturally differs in some respects from the above. The simplest function of such a work is to give the proper spelling and correct pronunciation of words, and many users of dictionaries seldom advance beyond this stage, or, at the furthest, that of looking up the meaning of some unusual word; articles on the simpler words are seldom consulted, except when the question of etymology arises. This is quite in accordance with the fact already mentioned, that the earliest English dictionaries were professedly collections of "hard words," to which the common elements of the language were not added till more than a century afterwards. The selective method adopted by Johnson was not imitated, and for the past hundred years, dictionaries of the English language have vied with each other in adding to the number of recorded words. Within the past thirty years, the larger dictionaries have also become more encyclopaedic in character, and devote much space to information relating to things rather than to words. Whatever objections there may be to this composite character, it is certain that the regular consultation of standard dictionaries is greatly encouraged by the increased information thus supplied. The accompanying disadvantages are a steady increase in size making the volumes cumbrous to handle, and a tendency to give much more space to the technical and scientific vocabulary than to purely linguistic and literary matter. On the whole, however, the balance between these rival elements is still so far preserved, that the educative value of the leading dictionaries, for both scholarly and practical ends, cannot easily be overestimated.

Consulting a Dictionary. On account of the fund

of information thus rendered easily accessible, the habit of consulting a dictionary and the proper method of doing so deserve to be included among the elements of a good general education. The precise means by which this end may be attained are matters for the educator, but it is important that those who are to continue their studies beyond their school-days should know the chief lexicographical works in their own language, and should be aware that these are the natural sources of information on linguistic and many other matters. The result of such instruction being neglected is that many persons labour under erroneous ideas, or spend much time in investigating special points, which could be cleared up or settled in a few minutes by referring to one or other of the leading dictionaries. The chief remedy for this would seem to lie with the teachers in our schools and universities, who should direct the attention of their pupils and students to the importance of making proper use of these and other works of reference. Even if the larger dictionaries are beyond the reach of most except in public or university libraries, there are smaller ones in existence which are good in their present form, and will either be improved in time or replaced by better. In some points, such as etymology, English lexicography is now rapidly approaching a state on which vital changes can scarcely be made, so that greater uniformity in some respects ought to mark the new editions of such works. The English language, however, is developing so rapidly at the present time, that the demand for new dictionaries will steadily increase, and the necessity of using them become steadily greater; it is, therefore, all the more important that the habit of using them regularly, and the art of using them well, should become more common.

W. A. C.

DIDEROT, DENYS (1713-1784).—Born and educated at Langres, for a time devoted his entire attention to studies, and gained a living by literature and teaching in Paris. He wrote anything from indexes and advertisements to dramas and sermons. His first original work was *Pensées Philosophiques*, which put him among the philosophers who were revolting against spiritual tyranny in France. Among his friends were Rousseau and d'Alembert (*qq.v.*) whom he assisted in compiling his *Encyclopédie*. Diderot accumulated a large library, but sold it to Catherine of Russia, who invited him to St. Petersburg and commissioned him to draw up schemes for education in Russia. Diderot lived for some years at St. Petersburg under Catherine's patronage, and outlined his plans, which included education for all from the lowest peasant to the highest official. The Empress established many schools to carry out the reformer's ideas. Diderot advocated compulsory free attendance, free provision of books, and even free meals, if necessary. In higher education, he made science the basis of true education, and in the universities he gave minor importance to theology and law. Diderot returned to Paris in 1784, but died a few days after his arrival. The day before his death, in a philosophical discussion, he uttered his famous dictum: "The first step towards philosophy is incredulity." His last literary production was a life of Seneca. A collection of his works in twenty-two volumes was published in 1821, and four volumes of memoirs, etc., in 1831. Carlyle wrote one of his profoundest essays on the work of Diderot.

DIESTERWEG, FRIEDRICH ADOLPH WILHELM (1790–1866).—A German pedagogue who studied at Tübingen and engaged in private teaching at Mannheim. From 1811 to 1813 he was professor successively at Worms and Frankfurt, and in the latter year became rector of the Latin school at Elberfeld. From 1832 to 1847 he was director of the seminary of the Berlin city schools, and lost this position owing to his reactionary policy in the later years, under the Minister Eichhorn. He then lived privately, writing on many controversial subjects. His educational works include *Jahrbuch für Lehrer* (Annals of Pedagogy), and treatises on Geometry, German Language, Arithmetic, and the Calculus.

DIESTERWEG, WILHELM ADOLPH (1782–1835).—A German mathematician who was educated for theology and, in particular, took up the study of education. Later, he studied mathematics while professor at the Mannheim Lyceum. He became, in 1819, professor in the higher school at Bonn, where also he was appointed director of the Commission of Scientific Research, a post which he retained until his death. His principal works were *Handbook on Trigonometry* (1824), *Propositions of Geometry on the Greek Method* (1825), and translations of various scientific works of Apollonius of Perza.

DIET OF CHILDREN IN SECONDARY SCHOOLS, THE.—The problem is twofold, according as the school is a boarding or day school.

Boarding Schools. Existing methods were fully discussed at the First Guildhall School Conference, 1912, and met with severe, though not unmerited, criticism. The *Lancet* (14th Sept., 1912), reviewing "Our Children's Health at Home and at School," in which the proceedings are reported, said: "All speakers were agreed that greater variety must be introduced into the dietaries; that vegetables and fruit should bulk more largely in the programmes; that large quantities of meat were not essential; that more time should be allowed for meals; that more trouble should be taken in the amenities of the table; and that the food should be presented in a more appetising form."

Such reforms would incidentally bring in their train the abolition of the "tuck" box and shop, of which Dr. Clement Dukes said at the Guildhall: "It is a mediaeval and barbarous arrangement which permits supplementary food and hampers to be furnished in repair of the recognized inadequacy of the school supply."

Bad housekeeping, which, in the view of the *Lancet*, was chiefly responsible, is not peculiar to schools; it is characteristic of most institutions where numbers are catered for. The remedy advocated by the influential Hospital Matrons and Schools Committee appointed by the National Food Reform Association in 1912 was the provision, as in America and Canada, of adequate training in institutional housekeeping. Such a trained woman housekeeper should be given a free hand as to contracts, and all school committees and governing bodies should include not less than one-third women.

Domestic training in schools and continuation classes is essential to the smooth working of such a reform. Boys, also, should be trained in some

branches of home-making. It is scarcely creditable to us as a nation that our secondary teachers may be ignorant of personal and school hygiene and elementary physiology, obligatory subjects at all primary training colleges. If reform of the home—which must accompany reform in the school—is to be brought about, drastic changes in the medical and school curricula are indispensable. These should include dietetics as well as hygiene in the former curriculum, and domestic economy in the latter. Parents should, in the words of Mrs. House, "give the lead by their choice of schools." Last, but not least, increased co-operation between school authorities and parents is necessary.

Day Schools. Here only the mid-day meal, if any, is provided. The best medical opinion attaches great physiological importance to a mid-day rest. It seems probable, indeed, that much digestive and nervous trouble in children is connected with hurrying to and from school and with hasty meals. Moreover, the "scratch" dinner taken by so many, is scarcely less injurious. The next few years are therefore likely to witness an extension of the practice of remaining for the school mid-day meal. This problem has been discussed by Dr. Alfred Mumford, and Dr. Catherine Chisholm, of Manchester, who give instructive accounts of methods of enlisting parental co-operation. C. E. H.

References—

- DUKES, CLEMENT, M.D., *Essentials of School Diet.*
- MILES, EUSTACE, *Better Food for Boys.*
- MOORE, DOROTHY C., *Dietaries for Secondary Schools. The Feeding of Children.*
- Our Children's Health at Home and at School.* (The National Food Reform Association.)
- The Feeding of Nurses.* Report of a Conference of Hospital Matrons held at Caxton Hall, 1910.
- Transactions of the Second International Conference on School Hygiene.*

DIET OF PRIMARY SCHOLARS, THE.—The subject lends itself to a threefold division; and we may take as our starting point the papers read and discussed at the Second Guildhall School Conference, 1913, and incorporated in *Rearing an Imperial Race*.

1. **All Children attending a Primary School.** It was shown that the dietary of the average town or country child left much to be desired. An excess of starch was coupled with a serious deficiency of body-building material (proteid), and of fat. The meals were too often taken at irregular intervals and under most unfavourable conditions.

2. **Under-nourished or Necessitous Scholars receiving Free Dinners, Breakfasts, or both.** The system under which the Local Education Authorities provide meals for under-nourished scholars only dates from the Act of 1906. The conclusions reached at the Conference of 1913 indicate the main lines along which reform should proceed. The selection of the children, notwithstanding the evident intention of the Act, was too often made on a "poor law" instead of on an educational and medical basis; here the teacher, school doctor, and Care Committee should play the leading parts. There should be no invidious distinction drawn between children taking the meals and those not. (The Paris example should be followed; there, without any differentiation, a meal is provided for all whose parents are unable to

supply one.) The place was frequently unsuitable, while the social and educational sides of the meal were largely neglected. The food itself, with notable exceptions, was shown, in most cases, to be lacking in variety, and was inappropriate for children (many of whom were delicate), especially infants. The service and supervision, too, left much to be desired. Notwithstanding the deplorable condition of the teeth of most children, care was seldom taken to enforce mastication, the inadequate time frequently allowed being a contributory cause. The limitation to school days of the supply of meals found no defenders, and has since been removed by the Provisions of Meals Act, 1914. Lavatory (with soap and towels) and sanitary accommodation is essential. The problem of the country school child, though naturally differing in character, was unexpectedly shown to be no less pressing. The remedy favoured was a dinner provided by the Education Authority, prepared, if possible, by the elder girls; parents should, *prima facie*, be expected to pay for this. From Sir George Newman's Report for 1913, it appears that about half the ill-nourished children in this country receive meals during a bare third of the year, which shows the magnitude of the task. In hard times, a rapid development of the scale on which meals are provided appears certain. This will be facilitated by the system of grants in aid (up to 50 per cent. of the net expenditure) introduced in the summer of 1914, and already making for greater efficiency. Moreover, a more rational conception of education, recognizing its physical basis, has latterly been adopted.

3. Children attending Open-air and Special Schools. These being abnormal, their diet receives particular attention, but they suffer from not having specially trained housekeepers C. E. H.

References—

- BULKLEY, M. E. *The Feeding of School Children.*
 HITCHING, WILENA. *Home Management.*
 KELYNACK, T. N. *Medical Examination of Schools and Scholars.*
 PATON, GRACE M. *The Child and the Nation.*
 WINDER, PHYLLIS D. *The Public Feeding of Elementary School Children.*

DIFFERENTIATION OF FUNCTIONS.—Physical functions are performed by organs set apart for that purpose. The development of an organ for a special function leads to differentiation of that organ from others, and an increased sensitiveness of the organ for its own work. While all organs of sense perform their functions through the contact of nerve ends with external matter, differentiation of their functions distinguishes one sensation of touch as sight, another as hearing, and so on.

DIFFERENTIATION OF STUDIES.—This is contrasted with correlation, and is the separation of knowledge of general utility into the various channels in which it may be applied. Thus, the study of history is correlated with geography in the teaching of junior pupils; but in the case of senior pupils and students, it is differentiated into biography, economic history, ecclesiastical history, and other branches, in each of which the earlier general history is applied.

DIJON UNIVERSITY.—This was founded in 1722 by the Duke of Bourbon, and sanctioned in 1723 by

a papal bull. Until its suppression in 1793, it had only one faculty, that of law. It was reconstituted in 1804, and faculties of science, literature, and medicine were subsequently added. In 1896 it passed under State control as a branch of the University of France.

DIOMYSIUS OF HALICARNASSUS.—A celebrated Greek rhetorician, who died at Rome 7 B.C. His principal work was a history of Rome from the earliest times down to 264 B.C. It consisted of forty volumes, of which eleven still exist. He also wrote many rhetorical and critical works, abounding in valuable remarks and criticisms on the works of Greek classical writers.

DIPHTHERIA.—(See AILMENTS AND INFECTIOUS DISEASES IN SCHOOL LIFE. INFECTION AND SCHOOL CHILDREN.)

DIPLOMA (Greek: *δίπλωμα*).—A folded paper, and originally an official document such as a license or a passport. The term is now applied to the official document issued by a university to the holder of a degree, or by a professional body granting to the holder the right to exercise some function such as to practise law or medicine.

DIPLOMAS FOR TEACHERS.—The most satisfactory and convenient way of approaching this subject is through a discussion of the qualifications desirable and the tests to be applied for entrance upon the Teachers' Register (*q.v.*). The term "Teachers' Diploma" is applied somewhat loosely; it may refer to: (a) Diplomas in the art and practice of teaching (*e.g.* the Teachers' Diploma of London, and other universities); (b) diplomas of a purely academic character; (c) diplomas which combine both of the foregoing.

It should be noted that, in the references below to the requirements of the Registration Council, we are concerned only with what are termed the "permanent" conditions of registration (*i.e.* those which came into force from 1921 onwards). Up to 31st December, 1920, applicants were admitted on experience only, irrespective of academic qualifications or training.

The policy of the Registration Council is that, ultimately, all candidates for registration shall go through a course of training in the principles and methods of teaching, accompanied by practice under supervision. This course must extend over a period of at least one academic year. For the present, however, this regulation will not be enforced in those cases in which facilities for training do not exist. This applies to certain classes of special teachers (*e.g.* technological teachers), for whom proper provision for pedagogical training does not exist. The training in pedagogy may, or may not, be concurrent with the academic training; in fact, the Council will, in all probability, not be rigid as to the precise form of the training, provided that it is sufficient and of a satisfactory nature.

Qualifications for Different Types of Teachers. Although the Council has formulated different conditions of qualification corresponding to the different types of teachers, it does not, for the present, require that a teacher who is engaged in teaching in a particular type of school shall possess the qualifications suitable for that type. For example,

a teacher who possesses the Elementary School Teachers' Certificate, but is teaching in a secondary school, would be admitted to the Register, provided that the conditions as regards experience, etc., are satisfied. In future, however, it will usually happen that an applicant will possess the qualifications suitable for the type of school in which he is teaching.

The existing requirements for the different types of teachers are as follows—

(a) **UNIVERSITY TEACHERS.** In the case of recognized teachers in universities and institutions of a university standing, no qualification other than that of experience (three academic years) is required.

(b) **SECONDARY TEACHERS.** The academic qualification expected from secondary teachers is that of the final degree examination of any university approved for the purpose of registration. This would, of course, apply to all British universities; but in the case of foreign universities, approval by the Council for this purpose is necessary. As regards training, since there are ample facilities for training for secondary teaching, this will be insisted upon. All the teachers' diplomas of universities and training institutions will be accepted, provided that the training in them is carried on under conditions approved by the Council. For *Specialist Teachers*, see (d).

(c) **ELEMENTARY TEACHERS.** For those teachers in elementary schools, the qualification required is the certificate approved by the Board of Education as qualifying for recognition as a certificated teacher in public elementary schools. The requirement in respect of training is enforced, and the untrained elementary teacher who has passed what is known as the Acting Teachers' Examination is not admitted to the Register on this qualification. There may thus exist in elementary schools a number of certificated teachers, recognized as qualified by the Board of Education, but ineligible for registration. In accordance with its policy that training in teaching is essential, the Council has approached the Board of Education with a view to the eventual abolition of the Acting Teachers' Examination.

(d) **SPECIALIST TEACHERS.** In this group, the difficulties of diplomas are much more complicated than in the other groups, owing to the many different types of teachers who are included. The Order in Council under which the Registration Council was constituted, shows ten distinct types of teachers within the group, but some of these (e.g. Technological) are themselves composed of widely divergent kinds of teachers. It has only been possible, up to the present, to lay down general conditions regarding the diplomas which will be accepted. In many cases, the only diplomas obtainable are those which are issued by technical or special institutions and do not require any qualification in the theory and practice of teaching. The main condition under which these will be accepted by the Council for registration is that the applicant has passed satisfactorily through a course of three academic years of full-time day instruction or five academic years of part-time instruction. The latter provision makes possible the acceptance of a diploma which has been gained by attendance at evening classes only. In order to provide for the admission of teachers such as workshop instructors, the period of five years' part-time instruction is decreased to three years, provided that the applicant has had seven years' practical experience in the industry

concerned after the age of 16. The degree of a university will, of course, be accepted.

The Council will also accept the certificates of examinations conducted by certain joint boards or other examining bodies, but only provided that the applicant satisfies them that he has passed through a course of instruction during the period mentioned earlier in this paragraph.

The great diversity of existing examinations for many classes of specialist teachers (e.g. commercial teachers) renders some standardization necessary. One of the tasks which lies before the Registration Council is that of co-ordinating, and possibly amalgamating, certain existing examinations and, so far as they are to be accepted as qualifications for teaching, raising their standard.

University Diplomas in Teaching. All the English universities now award diplomas in education. These are intended in most cases for those who intend to become teachers in secondary schools, but Sheffield and Manchester differentiate in some measure between primary and secondary. In most cases, candidates must first have graduated—Cambridge and Sheffield are exceptions. In all cases candidates must have taken a training course of not less than one year in duration and must also have satisfactory practical experience. Some universities, e.g. Oxford and Birmingham, insist that this experience shall be in secondary schools. At Leeds the diplomas are awarded to women only. Manchester University, in addition to awarding diplomas in education, also has a degree in education (M.Ed.).

Diplomas in teaching are also issued by the College of Preceptors.

Types of Specialist Teacher. The following information respecting some of the special types of teachers may be noted—

1. **TECHNOLOGICAL.** The degree of a university, the diploma or course certificate of a technical institution, or the certificate of some approved examining body, will be required; but there is a special and important provision to be noted in this group. When the degree or diploma has been gained in respect of a technological subject, such as Engineering, Mining, Textiles, etc., the Council will require that the applicant has, after attaining the age of 16, spent not less than thirty-six calendar months in the practice of the profession or industry concerned. Of this period, at least twelve months must be concurrent with, or subsequent to, the course for the degree or diploma.

These regulations refer to academic attainments only. Since there are no facilities for training teachers of this type, the condition as regards training will not be enforced.

2. **ART.** The Council has not yet issued a schedule of examinations which it will accept. The Board of Education's certificates for teachers of Art will be accepted. This certificate includes (a) examinations in Art; (b) the Board's examination in the principles of teaching with special reference to Art, and also requires evidence of good general education.

3. **COMMERCE.** The question of diplomas in commercial subjects is still under consideration by the Council and a special committee. The degree of a university will, of course, be accepted and the diploma of an institution which satisfies the conditions mentioned previously. Other certificates, such as those issued by the Society of Arts, the London Chamber of Commerce, and other bodies are being

carefully considered. In any case, the condition respecting attendance at a course will be insisted upon. The condition respecting training will probably be waived in this group until facilities are provided.

4. **DOMESTIC SUBJECTS.** The diplomas issued by the existing institutions for training teachers of domestic subjects will be accepted, provided that they extend over three years. In many of these institutions the usual course is only two years; but this, in future, will not be accepted by the Council. These diplomas include training in teaching, so that no other separate training will be required.

5. **PHYSICAL TRAINING.** There are several diplomas for physical training, which are issued by different bodies; but none of these have been approved by the Council pending the report of a special committee. There are hopes of an amalgamation of some of these examinations and the formation of a Joint Board. Should these hopes be fulfilled, it is possible that future diplomas will include an examination in the principles of teaching as applied to physical education. P. A.

DIPLOMATIC SERVICE, EDUCATION FOR THE.

—(See PUBLIC SERVICES, EDUCATION FOR THE HIGHER.)

DIRECT METHOD OF TEACHING.—The distinction between *direct* and *indirect* methods of teaching is practically the distinction between *instruction* and *education* or development. The teacher may prepare information and put it directly before the pupils as something to be learnt. This is desirable in some subjects of instruction, such as history, literature, and moral teaching, where the teacher speaks with authority; and also in many parts of other subjects where there must be some consideration of economy of time and labour in imparting and in acquiring knowledge. Generally, the indirect method of leading children to discover facts, laws, and inferences is more educational, especially in geography, grammar, and science; but the direct method must be employed to teach facts which cannot come under the child's own observation at school.

There is a special meaning attached to the phrase in connection with the teaching of modern languages (*q.v.*).

DIRECT METHOD IN TEACHING GREEK, THE

—(See GREEK, THE TEACHING OF.)

DIRICHLET, PETER GUSTAV LEJEUNE.—(See

GAUSS, KARL FRIEDRICH)

DISCIPLINARY VALUES.—(See FORMAL DISCIPLINE)

DISCRIMINATION.—The process of distinguishing differences in objects, or impressions which are essentially alike (*e.g.* between two shades of colour, two musical notes). The power of discrimination results from careful training of the senses.

DISINFECTANTS AND SCHOOL CHILDREN.—

The question of disinfection, as applied to school children, may be summed up in one word—"Cleanliness."

The main conditions requiring disinfection or

cleanliness in school children are pediculosis of the head or body, caused by head or body lice, and known as "dirty heads" or "dirty bodies," scabies or itch, and ringworm.

Pediculosis. The usual methods of detecting and dealing with "dirty heads" are as follows: The nurse visits a school and examines the heads of the children. If any are found with vermin, they are excluded; and a note is sent to the parents saying that the child's head is in need of attention. If no improvement has resulted when the nurse visits the school again, a second notice is sent, emphasizing the fact that the child's head is still infested with vermin and nits. The notice also states that the child will not be allowed to attend school until satisfactory improvement has been effected, which should be possible within ten days. If further exclusion is necessary, the parent is liable to prosecution for non-attendance of the affected child at school.

These two notices are usually sent in card form, enclosed in envelopes. On the back of each card, instructions for cleansing heads are given as follows:

"Even clean children are liable to become infected with vermin, and it is therefore necessary carefully to examine the hair every week or oftener.

"The following treatment will be found satisfactory in ridding the hair of nits or vermin—

"Obtain some White Precipitate Ointment from the Druggist, and rub it well all over the head and hair. Leave it on till next evening, then wash the head well with soft soap, and afterwards rinse it with water. (*Note that this Ointment is poisonous, if swallowed.*)

"After that, the hair must be brushed thoroughly with equal parts of water which has been boiled, and vinegar. This should be done every day until all the nits have come off the hair. Use a small tooth-comb daily. It will be found that the nits will have come off the hair in about 10 days. It ought not to be necessary to use the ointment more than twice.

"Where there are sores on the head, the vinegar should either not be used, or, if used, care should be taken to keep it off the sores."

Another method of ensuring cleanliness amongst school children is by the institution of cleansing stations under the Children's Act. Section 122 (1) of this Act empowers an authorized person to examine any child in a public elementary school, and in appropriate cases to give the parent notice to cleanse such child within twenty-four hours. Failing compliance with this notice, Section 122 (2) of this Act gives authority for the removal of such child to suitable premises, and for its detention until cleansed.

At an efficient cleansing station, provision is made for waiting accommodation, bathing the children, and sterilizing the clothing.

In the case of several children affected in the above way from one family, the writer has often found it useful to have the home disinfected; the clothing sterilized by steam under pressure; and the family altogether given a fresh start, from the point of view of cleanliness.

A sufficient distance between the pegs in a cloak-room is also advisable. Also, if second-hand clothes are bought, they should not be worn until they have been sterilized.

Scabies. In scabies or itch, it is necessary to use sulphur ointment on the child's skin and to sterilize the clothing.



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Ringworm. In ringworm, which generally affects the scalp, the hair should be clipped closely and even shaved around the patch, and ointment or antiseptic lotions used every day. Children affected should be excluded from school until microscopical examination of the hair shows absence of the causative parasite. At times, if a large number of cases occur, ringworm classes at school may be allowed; and then the children should wear close-fitting waterproof caps, and should not be allowed to mix with the other children. If cases of ringworm do not yield to the above treatment, they may be subjected to the Röntgen Rays, which produces epilation and causes the abolition of the parasite. Antiseptics should also be used in conjunction with this mode of treatment.

Only by strict attention to the above measures can school children be kept in good health.

ALFRED GREENWOOD.

DISINFECTANTS IN SCHOOL BUILDINGS.—

Disinfection is the destruction of agents that cause infection. Several natural agencies are constantly at work tending to do this. Indeed, Rosenau has stated that dryness, sunlight, and cleanliness are the key-notes of sanitary surroundings.

Formerly, disinfectants were often used, regardless of quantity or expense, and without thorough knowledge of their scientific action and application. The amount of "literature" bewildered municipal and education authorities alike. The day has passed when any thoughtful observer considers that the masking of a smell implies satisfactory disinfection. The overhauling of drainage systems in the hope of checking an outbreak of diphtheria, instead of examining and swabbing the throats of the scholars, is no longer considered a scientific method of prevention. Of course, defective drains should be remedied; but too often, in the past, the surroundings have been examined instead of the scholars. Pouring disinfectants down drains is now regarded as useless and expensive.

Within certain limits, disinfection may arrest the spread of some infectious diseases by destroying the infective organism, as in enteric fever and diphtheria. There are many difficulties, however. The fact that the specific organism of certain infectious diseases, such as scarlet fever and whooping-cough, has not yet been isolated; the fact that various infectious diseases spread in different ways; and the fact that the resisting powers of specific organisms differ, are all complicating factors. A greater knowledge of the spread of infectious diseases is necessary before disinfecting processes can be rendered satisfactory in every instance.

With respect to the spread of enteric fever, diphtheria, and pulmonary tuberculosis, our knowledge is greater than in such diseases as scarlet fever, measles, and whooping-cough; and our methods of disinfection consist in dealing, in one way or another, with the patient, the clothing, the rooms, and the various articles with which the patient has been in contact. The measures taken, however, differ in the home and in the school.

It would appear that the infection of measles cannot be remedied by disinfection, as this disease is probably spread by personal infection from scholar to scholar. And in respect to scarlet fever and diphtheria, it is probable that personal contact is more responsible for the spread than such agencies as school dust.

Disinfectants can never replace vigorous scrubbing, free ventilation, and sunlight; but they may be employed usefully in conjunction with wet cleansing. Yet, if the addition of a disinfectant to the pail of soap and hot water tends to diminish the vigour of the scrubbing, the disinfectant had better be omitted.

The causes of dust in schools are: Mud and dust brought in on the boots; dust from fires and chalk, and particles of clothing, hair, skin; and dried secretions from the throat, nose, and ears.

Every school should be constructed so that, in its interior, there are as few resting-places for dust as possible. For example, there should be few right-angled corners, and the caretaker should be able to clean under the desks, etc. There should be a ledge at the lower part of each blackboard to catch the chalk dust. For cleaning the boards, erasers may be used, and these should be cleansed regularly. If cloths are used, they should not be too large, and they should be moist. Dry dusting and dry sweeping should now be regarded as obsolete acts.

The chief methods of removing dust from schools are three, namely, (a) Vacuum; (b) oiling; (c) wet cleansing.

(a) **Vacuum.** As stated by Kerr, where dust is removed by a stationary vacuum apparatus installed in a school, disinfection need never be thought of. This is, however, usually found only in schools recently built. The central apparatus is in the basement, and the rooms are connected by pipes to the apparatus.

(b) **Oiling.** To prevent the dispersion of dust from the floor into the air of the classroom, various kinds of special oils are used. During the holidays, the floor is washed with soap and soda, and, having dried, is oiled over evenly. The writer has found that these preparations cause a marked diminution in the organisms present in the air, and no washing of floors is needed. The oil should be applied again after the first three months. The disadvantages of this method are that at first the women teachers' dresses become soiled (hygienically, they should be sufficiently short to be unaffected), the floors become much darker, and the children slip (especially those in the North of England, who wear clogs).

(c) **Wet Cleansing.** Wet cleansing removes the organic matter which micro-organisms need for their growth.

The thorough wet cleansing of a school is probably more important than the adoption of disinfecting processes. As much dust as possible should be removed, not so much for the alleged reason that dust is the chief factor in the spread of infectious diseases in schools, since this is doubtful; but because it is irritating to the eyes, skin, nose, and lungs, and may obscure the windows.

The wet cleansing of a school should involve a daily cleansing, a weekly cleansing, and a special cleansing before the beginning of each term.

In the daily cleansing, the floors should be sprinkled with wet sawdust after the scholars have left. The floors should then be swept, especially in the corners and under desks and radiators, the windows being open. The sweepings should be burned if possible, or placed in a covered metal ashbin. Next morning, before the scholars assemble, the desks and seats should be rubbed with a damp cloth. Each day, fibre mats and scraper mats should be well shaken and cleared. Once a week this cleansing should be more thorough. Blackboards should be washed, including the chalk trough.

Every month, all maps, walls, and woodwork should be wiped down with a damp cloth, and the cloakrooms sprayed. Before each term, everything possible should be well scrubbed or washed. Windows should be cleaned inside and outside when necessary.

If disinfection should be considered necessary, the walls and furniture may be sprayed with a formalin solution, and the floors scrubbed thoroughly with soap and hot water.

The best liquid disinfectants are: Formalin, 2 per cent.; Izal, 1 per cent.; and chloride of lime, 1 per cent.

In residential schools in which acute communicable diseases have arisen, clothing, bedding, curtains, and other fabrics may be disinfected by steam under pressure at a central disinfecting station, and the walls and furniture may be sprayed with Formalin solution and the floors scrubbed thoroughly with soap and hot water.

Gaseous disinfection of schools is not easy to carry out, owing to the need for sealing all openings. Of the gaseous disinfectants, formalin and formic aldehyde vapours are the best. After such disinfection, free ventilation of the room for several hours is necessary.

With respect to the slow combustion of sulphur, it has been proved that the amount of sulphur dioxide produced by the largest amount of sulphur that can be burned, under the most favourable conditions, in a room—namely, about 5 lb. of sulphur per 1,000 cub. ft. of air space—is ineffective for disinfection. Sulphur dioxide gas, also, is inferior to formalin gas in germicidal power and penetrating ability.

Consideration should be given to the question whether or not books and papers requiring disinfection should be destroyed by fire. Those which cannot be destroyed may be exposed in an air-tight chamber to formaldehyde gas. The books should stand wide-open on perforated wire trays.

Towels, which may tend to spread ophthalmia, should be boiled, or disinfected by steam under pressure. Clean towels should be placed in lavatories twice a week.

If it is suspected that the sand or clay used in modelling is a factor in the spread of scabies, it must be destroyed. Washing should be sufficient to render pencils and slates free from possible infection.

The surface of the playground should be kept clean; if it is impervious, it is easier to keep it so. Less dust will then be brought into the school. No paper or rubbish should be allowed to accumulate in the playground.

Strict cleanliness, with copious flushing, if possible, should obtain in sanitary conveniences, urinals, lavatory basins, drinking cups, and gulleys.

In short, cleanliness, in every sense, is the paramount factor in maintaining a high standard of sanitary efficiency in school buildings.

ALFRED GREENWOOD.

DISMISSAL OF TEACHERS.—(See **TEACHERS' AGREEMENTS.**)

DISPOSITION.—A tendency towards a certain line of conduct, associated with inclination and with temper. Disposition relates to the whole frame of

the mind, is permanent and settled, and comprehends the springs and motives of action; while temper is transitory and only temporarily influences actions. It is more positive than inclination. A man always does what he is disposed to do, but not always what he is inclined to do. A good disposition makes a person a good member of society.

DISPUTATIONS.—Before the introduction of printing, all methods of teaching were necessarily mainly oral. In the earliest centuries of Christianity, systematic religious instruction was chiefly of the catechetical order. The teaching of grammar, e.g. in the text-book of Donatus, (the *Ars minor*) followed the same method. The disputation was a development of the catechetical method, which only attempted to induce the learner to adopt the conclusions of his teacher, and accept the reasons which satisfied the framers of the questions and answers, usually stereotyped. The aim of the disputation was to exercise the learner in dialectic. He was given a topic, or proposed one himself, and skilled reasoners tested his ability to sustain his thesis by valid arguments. Such a method was undoubtedly calculated to train alertness in reasoning, and presumably to enable a pupil to think out his own opinions, and to thresh out *pros* and *cons*, until opinions became convictions. The indictment brought against the dialectical method of the Middle Ages by such Renaissance scholars as Erasmus and Vives is that its general practice had resulted in developing the pride of victory against opponents, and not the love of the discovery of truth.

Subjects and Methods of Dispute. The mediaeval subjects of study were the Seven Liberal Arts (*q.v.*). The aim of studying these (viz., Grammar, Rhetoric, Dialectic, Arithmetic, Music, Geometry, and Astronomy) was not merely the attainment of knowledge of the subject-matter. As in the Church and in philosophy, the Middle Ages were dominated by the idea of a hierarchy; great emphasis was laid, in theory and practice, on the rank of the various subjects, resulting, in the end, in the complete subservience of all the subjects to Dialectic. Dialectic became the essential instrument for utilizing the material of knowledge supplied by the other subjects, the organon by which all knowledge was converted into a form, for mediaeval practice. Dialectic or Logic was the system of syllogistic or deductive reasoning which supplied the form for every argument. Formal truth, not material truth, was all that such a method could be relied upon to attain. "The mediaeval disputant," says Latham (*Action of Examinations*, p. 110), "brought with him into the schools his Bible, his Decretals, or other ecclesiastical authorities bearing on his point, or else his Aristotle, or his Corpus Juris, according to his subject. Besides this, he had a little store of *dicta* of the schoolmen which were held absolute on points of logic; and, when he had brought any position under a head on which his authority spoke clearly, then it was *valet quaestio* or *cadit quaestio et argumentum*, as the case might be." In the more elementary studies, the boy was exercised in dialectic over disputed points in grammar (in the text-book of Donatus or Priscian), and the provision of glosses and traditional interpretations in the MS. text-books only made the task more complicated. Disputations on grammar continued in English schools into the sixteenth century. They

were forbidden by Colet in his statutes for St. Paul's School in 1518. We are told by Holinshed (1555) that "on Bartholomew even, after the Lord Maior and Aldermen of London had rid about Bartholomew Faire, they caym to Cristus Hospital [Christ's Hospital School had been founded in 1552] within Newgate, when they heard a disputation betweene the scholers of Paule's Schoole, Saint Anthoni's School, and the scholars of the said Hospital." The "Paule's" school thus mentioned is probably the cathedral school and not Colet's, for the cathedral school had held these disputations in grammar since the twelfth century, if not from an earlier date. Rev. H. Anstey tells us that in the mediaeval requirement at Oxford for the "determination" or final test for a degree was an exercise which consisted in going round the schools (thirty-two in number) replying to the questions put by each master in his turn, and involving nine days of disputation. . . Each candidate, in his turn, stood up before the master, who proceeded to *pose* him, if he could, subject, however, to the control of the Proctors and Chancellor; or the candidates disputed in pairs, by turns, corrected and called to order by the presiding master. After "determination," corresponding to our B.A. degree, three years further training was necessary to "incept" for the M.A. degree. This degree gave the right to lecture and teach in the university, and to receive money for such teaching, the whole course suggesting the mediaeval view of the *training of teachers*.

Disputation in the Universities. In the universities, the disputation remained even in the sixteenth and seventeenth centuries, but the subjects altered. Instead of the old topics involving metaphysical treatment of subjects of the Liberal Arts, with their *realitates*, *formalitates*, *entitates*, and *de modo significandi vocum*, the old Aristotelian subjects fell into disuse. Subjects became more and more theological, corresponding more to the vital problems of the age. In the latter part of the seventeenth century, subjects in physical science suggested by the study of Bacon and Descartes were chosen. In the eighteenth century, this adaptation to the intellectual problems of the age can be illustrated by subjects connected with the views of Newton on questions of Physics. Latham states that the University of Cambridge abolished the Disputations in the Faculty of Arts only in 1837, and in the Faculties of Divinity, Law, and Physic in 1858—though they had fallen into desuetude for many years previous. Indeed, it has been said that the great period of learning and research in England of the seventeenth century "fostered the efforts of students rather by encouragement, than by disputations." The system of written examinations began to develop only in the latter half of the eighteenth century (Wordsworth: *Scholae Academicæ*, p. 45); and the *viva-voce* tests in certain examinations may be regarded as survivals from the old disputation.

The dialectical form of disputation to some extent survived when instructional methods passed from the oral to the written exercises. In the great disputes between Roman Catholics and Protestants in Queen Elizabeth's reign, much of the controversial literature recalls the old oral method of disputation. And, in 1609, a college was established, under the patronage of king James I as a spiritual garrison, with a magazine of all books for that purpose; where learned divines should study and write in maintenance of all controversies

against the papists" (Fuller: *Church History*: Book I, p. 51).

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DISSENTING ACADEMIES, THEIR CONTRIBUTION TO ENGLISH EDUCATION.

—The educational debt which England owes to Dissent is not confined to the eighteenth century, nor to the particular form of educational institution known as the Dissenting Academies. After the ejection in 1662, the excluded Dissenting ministers were driven by sheer necessity to teaching and school-keeping as their sole remaining means of livelihood; and, as tutors or schoolmasters, they covered every grade of educational work—from the most elementary upwards. It is only the reputation of the eighteenth-century academy which has obliterated the memory of the earlier labours of Dissent in the realm of elementary education. The list of Dissenters' Licences (granted in 1672-1673) reveals the extent and diversity of that earlier phase, and yields a multitude of names of Dissenting ministers in every part of the country who had opened schools. From the Five-Mile Act, in 1665, to the Toleration Act, this educational work was all under the cloud of persecution; but when the Toleration Act had given it the right to exist, and when, further, in 1700, the episcopal power of licensing teachers was by legal decision limited to the Grammar School, Dissent flung itself into the work of education with astonishing zeal. In Devonshire, Lancashire, London, and Wales, schools of popular character—some styled specifically charity schools—had been opened even under the *régime* of persecution. Fostered by liberty, this work widened, still, in the main, keeping up its connection with Dissent. The school and the meeting-house were close together, if they were not under the same roof. Yet this educational effort was elementary in scope and secular in range. For instance, George Fox's plan, in 1674, for a boys' school at Waltham and a girls' school at Shacklewell, insisted on "instruction in whatsoever things were civil and usefull in the creation." And there is a thin thread of demonstrable connection between these earlier denominational schools and the late eighteenth century institution of Sunday schools. Raikes, indeed, derived his idea of the Sunday school from William King, a Dissenting card maker at Dursley; and Joseph Lancaster, the founder of the Lancastrian schools—later, the British and Foreign School Society—was a Quaker. If these later institutions have the credit of first spreading the idea of general elementary education, it still remains true that they inherited the conception itself from the earlier Dissenters' charity schools.

Commercial Schools. Dissent played a decisive part also in secondary education. Many of the schools founded after, or even before, the Restoration were, in fact and in intention, commercial schools, fitted to provide education for a mercantile career. Naturally enough, such schools are found mostly in or near great commercial centres. Hanserd Knollys's school, which, from 1658, was located in the old Artillery Ground in Spitalfields, was

frequented by the sons of City merchants. He provided a commercial education; but, significantly enough, retained Latin, Greek, and Hebrew in his course of instruction, writing his own text-books for the purpose. However specifically commercial or mathematical any of these schools might be, the movement never lost its hold and insistence on Latin. At Samuel Jones's school at Tewkesbury, Latin was the medium of instruction, as it was also in John Ward's school in Highgate and Clerkenwell. These were probably extremists, and the habit died out in the first quarter of the eighteenth century; but, apart from this, the insistence upon a classical basis for higher education was unflinching. Even the Quakers had bowed to the stern rule. In their fifteen schools in 1690, the youths were instructed in Virgil, Horace, Juvenal, Terence, and so forth; and when, during the next decade, they reformed their curriculum by excising these authors, they stood practically alone for the first half of the century. Between these schools and the Dissenting Academy there is no strict line of demarcation. The notion that a Dissenting academy was a training college for the Dissenting ministry is quite mistaken. Before the ejection, as well as later, it was the custom for young applicants for the ministry to table or lodge with a minister of repute for the purpose of instruction or training. From such an origin sprang many a notable Dissenting academy; but, and this is the point to note, the moment the Academy became famous, it was frequented by laymen as well as by ministerial candidates, and, of necessity, its curriculum reflected the secular needs of the laymen as well as the theological needs of the professed candidate.

Curricula and Procedure. In view of such a *clientèle*, the Dissenting Academies, for a considerable portion of the eighteenth century, did, in a discreet way, supply the need of university education to lay Dissent, and, indeed, to many outside its pale. This result was only achieved by the consistently high level of scholarship in the tutors. A glance at the general curriculum will afford at once a measure of their attainments, and of the extent and quality of their instruction.

In 1711, whilst still at Samuel Jones's Academy at Gloucester, Thomas Secker (afterwards Archbishop of Canterbury) gives the following account of the method of instruction—

"Our logic comprehends all Hereboord, the greater part of Mr. Locke's essay, and the art of thinking. What Mr. Jones dictated was but short, containing references to places where it is more fully treated of, and explications when required. At our next lecture, we gave an account both of what the author quoted and our tutor said, who commonly then gave us a larger explication of it and so proceeded to the next thing in order. He took care, as far as possible, that we understood the sense as well as remembered the words of what we had read, and that we should not suffer ourselves to be cheated with obscure terms which had no meaning. Though no great admirer of the old logic, he has taken a great deal of pains in explaining and correcting Hereboord, and has, for the most part, made him intelligible or shewn that he is not so. . . . I began to learn Hebrew as soon as I came hither, and find myself able now to construe about 20 verses in the easier parts of the Bible after less than an hour's preparation. We read every day 2 verses apiece in Hebrew, which we turn into

Greek: this, with logic, is our morning's work. Mr. Jones also began about 3 months ago some critical lectures. The principal things contained in them are the antiquity of the Hebrew language, letters, vowels, the incorruption of the Scriptures, ancient versions of the Bible, and an account of the Talmud, Masora, and Cabala. We are at present upon the Septuagint, and shall proceed after that to Targumim and other versions. . . . This is what we first set about in the afternoon, which being finished, we read a chapter in the Greek Testament, and, after that, mathematics. We have gone through all that is taught of algebra and proportion, with the first six books of Euclid. . . . Our daily employment in the morning takes up about two hours, and something more in the afternoon. Only on Wednesdays, in the morning, we read Dionysius's *Periegesis*, on which we have notes; and in the afternoon we have no lecture at all. On Saturday afternoon we have only a thesis, which none but they who have done with logic have any concern in. We are just beginning to read Isocrates and Terence, each twice a week. We are obliged to rise at five of the clock every morning, and to speak Latin always, except when below stairs with the family. The people where we live are very civil, and the greatest inconvenience we suffer is that we fill the house rather too much, being 16 in number besides Mr. Jones. But I suppose the increase of his Academy will oblige him to remove next Spring. We pass our time very agreeably betwixt study and conversation with our tutor, who is always ready to discourse freely of any thing that is useful, and allows us all imaginable liberty of making objections against his opinion and prosecuting them as far as we can. In this and everything else he shows himself so much a gentleman, and manifests so great an affection and tenderness for his pupils as cannot but command respect and love. I almost forgot to mention our tutor's library, which is composed for the most part of foreign books, which seem to be very well chosen and are every way of great advantage to us."

We possess exactly similar details of John Jennings's system of education at Kibworth, and of Dr. Doddridge's system at his celebrated academy at Northampton; but it would be tedious to prolong such quotations.

Influence and Success of the Academies. Such an illuminating extract relative to the curriculum of the Dissenting academies reveals one curious feature: the strange juxtaposition of most advanced science, both mathematical and physical, with Hebrew, Greek, and Latin. The key to this juxtaposition is furnished by the internal history of Dissent itself. The first generation of these great teachers, the men who were ejected in 1662, were university men of high academic attainments. Of necessity, they never lost touch with the classical and theological training of their own youth. The next generation fell in the time when the disintegration of Dissenting Church polity had produced the great wave of free thought which, in its successive phases of Arianism, Deism, and Unitarianism, fills so large a space in the ecclesiastical and intellectual history of the eighteenth century. The ultimate essence of this movement was intellectual freedom; and the boon of achieving this freedom for the modern world is in great measure due to Dissent, bitterly as it paid for such service in its own disintegration and devitalizing loss of spirituality. Even more than in

the Church polity of Dissent, this movement is reflected in the Dissenting Academies in their feverish zeal for physical and chemical study, as well as in their actual tendency towards Unitarian thought. Such a strangely bifurcated line of study and thought is traceable in academy after academy and in tutor after tutor; and to this duplication is due the extraordinary fact that tutors who, as mathematicians, physicists, and chemists, acquired world-wide renown, remained to the end of their days absorbed in theological controversy.

In its short-lived but brightly burning career, Warrington Academy (1757-1783) typically exemplifies this strange combination. It was started as a frankly rationalistic academy with a "rational" liturgy. All its tutors were Arians, yet, besides Joseph Priestley himself—the greatest name in eighteenth century English science—the roll of these tutors included Gilbert Wakefield, Dr. Enfield, and Dr. J. Aikin. The last-named transmitted his genius to his daughter, Mrs. Barbauld, author of *Hymns in Prose*; to his son, Dr. John Aikin, the friend of Roscoe and Howard the philanthropist, and known even yet by his *General Biography* and his botanical studies; and to his grandchildren, Arthur Aikin, author of works on mineralogy and chemistry, secretary to the Society of Arts, and Lecturer on Chemistry at Guy's Hospital; and Lucy Aikin, authoress of the *Memoirs of the Courts of Queen Elizabeth, James I, and Charles I.*

Such few names alone may serve to show what a heavy debt of obligation English science and letters owe to the Academies. But, apart from the contributions of this or that individual to the cause of science, *belles lettres*, or theology, the abiding claim of the Dissenting Academies to historical recognition rests on broader ground—on the high standard of academic education which they maintained during a century in which the English universities were nearly as palsy-stricken as the Church itself, and, chief and above all, on their contribution to the progress of unfettered thought of that intellectual freedom which has become the denominating note of our own later time.

W. A. S.

DISSENTING SCHOOLS IN THE EIGHTEENTH CENTURY.—(See CHARITY SCHOOLS.)

DISSOCIATION.—In chemistry this denotes the decomposition of one molecule of a substance into two or more molecules. In mental science, it is contrasted with association, and is the process of discriminating elements in a complex shape. That which is associated first with one thing and then with another becomes dissociated from either, and tends to be an object of mental abstract contemplation.

DISTRICT SCHOOLS.—(See POOR LAW SCHOOLS.)

DITTES, FRIEDRICH (1829-1896).—A German educator who was born in Saxony and, after finishing his education at Leipzig University, had a brilliant career as a teacher. He became sub-rector of the *Realschule* at Chemnitz, and was instrumental in bringing about the reorganization of education in the elementary schools of Saxony. In 1865 he became Director of the seminary at Gotha, and Inspector of the schools in the Duchy. In 1868 he was appointed director of the *Paedagogium* at Vienna, an institution founded to promote the higher education and training of teachers already

in office. He held this post till 1881, and became prominent as the re-constructor of the Austrian school system. In 1878 he established an educational review, *The Paedagogium*, to which he contributed frequent papers after his retirement.

DIZZINESS.—A sensation, frequently described as swimming in the head, caused by disturbance of the semicircular canals of the ear. It is not connected with the sensation of hearing, but affects the vision and the maintenance of equilibrium.

DOCKYARD APPRENTICES. — (See NAVAL ARCHITECT, THE TRAINING OF A.)

DOCTORS, SCHOOL.—(See CLINICS, SCHOOL.)

DODGSON, CHARLES LUTWIDGE (1832-1898), known to the literary world as "Lewis Carroll," possessed a dual personality. His working hours were spent as a mathematical teacher in an Oxford college; while his leisure was largely devoted to children, for whom he wrote the most famous of modern English story-books, *Alice in Wonderland*.

He was born at Daresbury, near Warrington, on 27th January, 1832. His father, the Rev. Charles Dodgson, was incumbent of Daresbury, and later Archdeacon of Richmond and Canon of Ripon; his mother was Frances Jane Lutwidge; from her maiden name, together with Charles, his *nom-de-guerre* was devised.

He was educated at Richmond, and Rugby (under Tait); and at Christ Church, Oxford, where he spent forty-seven years.

He took first classes in Mathematical Moderations and Final Schools, a second in Classical Moderations, and a third in Literae Humaniores. In 1856 he became a mathematical lecturer at Christ Church; he took part in all the college-life, and did practical work among the servants, but was little known to the undergraduates. He was ordained, but did not proceed to priest's orders, though he undertook occasional clerical work. He was Curator of the Common Room, an office of some importance in Christ Church. He had many college friends, among them Dr. Liddon, with whom he travelled through Russia. Outside Oxford, his friends included Tennyson, Ruskin, Millais, Rossetti, and Ellen Terry. He was one of the earliest amateur photographers, and has left excellent portraits.

He published many mathematical works, but they failed to obtain a wide circulation, partly because of his ingenuity in devising new symbols which he used throughout. The extraordinary inventive genius which immortalized him in *Alice in Wonderland* was less satisfactory when applied to the study of Mathematics. In the exercise of that inventive genius as applied to fiction, he occupied his leisure hours.

His place in education is, therefore, twofold: (1) as an Oxford mathematical teacher; (2) as the creator of a new form of children's book, so perfect of its kind that, twenty years after his death, it is being used as a school reading book all over England. The play on words, the fascinating paradoxical logic of the conversations, the parodies on life of the ungainly creatures who fill important rôles, make the two *Alices* far more than mere children's tales. Twenty years ago, the writer, in taking a clever little schoolboy round the Oxford Museum, described something as being "just like something in *Alice*." The boy answered: "Everything is like

something in *Alice*." This remark seems the best guarantee of Lewis Carroll's value in the education of children.

He was tall, spare, and clean-shaven; with well-cut features, and a peculiarly alert poise of the head and springy walk which made him recognizable from afar.

He was devoted to little girls, spending most of his time among them and writing for them as no other man has done.

For boys, as a rule, he did not care; partly perhaps because he was shy, and had a slight stammer. His least successful story, *Sylvie and Bruno*, is the only one containing a boy hero.

He died at Guildford, on 27th January, 1898, aged 66.

His chief works were: *Alice's Adventures in Wonderland*, 1865; *Through the Looking-glass and what Alice found there*, 1871; *The Hunting of the Snark*, 1876; *Sylvie and Bruno*, 1889; *The Nursery Alice*, 1890; *Sylvie and Bruno* (concluded), 1893, also many smaller works and pamphlets dealing with questions of the day, university affairs, and books on mathematical and logical subjects.

H. O'B. B.

DOLLET, ETIENNE.—(See CICERONIANISM.)

DOLLS IN EDUCATION, THE PLACE OF.—The plaything of the young children of many nations is the doll. The place it occupies in the development of childhood is insufficiently understood.

Whatever psychological reasons may be given for doll play, tender emotion is assuredly developed through the care and attention bestowed upon "dolly"; and dolls should, therefore, find a place in every household, crèche, nursery, kindergarten, and junior school. When the child grows old enough and tall enough to grapple with the big things of the adult world, doll play will fade away naturally and realities succeed it.

That small boys, as well as girls, should be encouraged to play with dolls would not be detrimental to the nation's manhood. Any play that foreshadows the caring for some other "self" than *myself* should not be laughed at by adults. We recognize the "mother spirit" in the wee maiden crooning over her dollie, the sharer of her joys and sorrows: why not encourage the "father spirit" in the small boy who will be called to defend the weak and helpless? In this way we will foster that instinct which "is the source of the only entirely admirable, satisfying, and perfect human relationship, as well as of every kind of disinterested conduct" (McDougall: *Social Psychology*).

The dolls should not be freak dolls or monstrosities, but simple representations of real people, strong of frame, with clothes that can be removed at will, and of a suitable size. How can one cuddle a doll as large as oneself or a monstrosity dressed in the height of fashion?

At a later stage, the domestic arts of sewing and knitting can be taught in a truly interesting way if dolly is fitted out with garments made by the little mother. Suitability of clothing, simple measurements, cutting out—all follow naturally. There are no tedious hems or long seams, and the transition from doll's clothes to clothes for a real baby, or a present for father or mother, is but a development. The child led on in this way takes an intelligent interest in one of the essential arts of life.

The drawing lesson invites the use of dolls. Here care must be taken to secure dolls of true proportions. The ordinary child finds it difficult to recognize the proportions of the human body; but with the appearance of a doll, which becomes an individual performing certain actions, the difficulties vanish.

What the child sees in miniature and verifies by reference to his own and his companions' bodies, he grasps readily. For example, the doll may represent a schoolboy called "Tom," who is about to take part in physical drill. He stands at "attention." For a few minutes the children observe the proportion of limbs to body; the doll is put on one side and the children sketch from memory. "Tom" marches; the children observe the balance of the body, and the position of the head with regard to the leg upon which the body is balanced at a particular moment. "Tom" kneeling with arms raised brings the length of arm and top of head under observation. "Tom" catching a ball, with head thrown back and the whole body, as it were, stretched upwards to catch the ball, presents new problems which are dealt with in the same way, viz., observation, sketching from memory, comparison of drawing with original attitude of doll, realization of faults by the child. The sketches are done quickly—for a child works quickly. All who have tried this experiment know how rapidly a child's work improves, the reason being that a child can see and think through a toy whose size he is able to grasp. The world is furnished for adults. We forget how difficult it is for small children to realize *big* things.

Geography and History call for a lavish use of dolls of all sorts. Nothing helps a young child to realize far-away scenes in place or time so well as a concrete model, made by himself if possible, which will enable him to grasp the setting either of a person or of a group of people. The land or times in which they lived, the difficulties to be overcome, the use to be made of materials at hand, the mode of transit, the value of exchange of goods, the need of tallies or tokens (money). All these subjects and many others grow out of doll play. It is the world in miniature, suitable for an immature mind, and presenting just those problems which will become stern realities as life advances.

"Take the doll away, you erase from the heart and head feelings, images, poetry, aspiration, experience ready for application to real life."

A. WALMSLEY.

DOMESTIC SCIENCE COURSE, KING'S COLLEGE, LONDON.—(See DOMESTIC SCIENCE IN SECONDARY SCHOOLS.)

DOMESTIC SCIENCE IN SECONDARY SCHOOLS.—Many things have contributed to the establishment of Domestic Science in the curriculum of the secondary school, though its advent there is of recent date. The higher education of women, proceeding on lines of somewhat abstract culture, or of necessity in a groove laid down for men, had demanded a preparation at school mainly to this end: and the whole curriculum was moulded to provide for the few scholars destined to a university course. Gradually this position has been modified, and by demands that have in themselves made easy the inclusion of Domestic Science.

Connection with the Other Sciences. The value of experimental science as a factor in general

education has made it general for every scholar in a good secondary school to take a course (or courses) of laboratory work in Botany, Physics, and Chemistry; while the more enterprising among the teachers have sought to make these subjects interesting by relating them to household and other common phenomena of daily life. They have sought the co-operation of the teacher of practical household work, with the result that both kitchen and laboratory have equally benefited. Many schools, notably Aske's at Acton, have for many years worked on this plan. Each scholar is put through courses of both Elementary Science and Housecraft; she is prepared for such external examinations as Matriculation in the ordinary time and without any undue strain. Indeed, the authorities consider that the practical kitchen work helps to develop certain natural abilities, and to strengthen the interest and meaning of "making an experiment." Laundry is not included in this Housecraft which follows a carefully graduated course along the lines of Clay Modelling, Cane-weaving, Needlework, Cooking, Housewifery, Dressmaking, and Household Hygiene. Another school that may serve to illustrate the co-ordination of science and housecraft is the Girls' Grammar School at Bradford, Yorks. To quote from a statement publicly made by the Head Mistress: "The science teaching, especially in the middle of the school, is made to bear as much as possible on the things of everyday life without interfering with the continuity of the work. That is to say, illustrations are drawn, wherever possible, from the household and from matters of common experience; but each instance is taken as illustrating some scientific principle or principles, the idea being, as far as possible, to get some ideas of scientific principles and the habit of applying them to the explanation of any problem that happens to arise, *not* to merely give scientific explanations of isolated phenomena, selected on account of their importance in everyday life." A carefully worked out course starts with Seasonal Nature Study, and proceeds with a graduated course of Botany, Physiology, Biology, Hygiene, etc., concurrently with a treatment of the Domestic subjects on rather more scientific lines than those followed in other schools.

Handwork and Domestic Science. The position of Domestic Science in secondary schools has been greatly affected by the claim of Handwork, and the need to find subjects suited to it for girls as well as for boys. Theories of education have emphasized the physiological aspect of psychology until the use of "finger-tips" in a definite development of brain energy has been established. Following the exercises of the Kindergarten in most schools, there had been a lull in manipulative tasks except as regards needlework of a purely mechanical type. Recently a more constructive scheme of garment-making has improved this, and practical Domestic Arts have been introduced. The Rodean School at Brighton has an excellent course of kitchen work from quite junior forms right through the school. Unfortunately, the use of Handwork as a factor in brain development has been emphasized so strongly for backward and defective children, that many schools have reserved practical work for the dullard only, and thereby created a certain attitude towards it which has made it unpalatable to the clever girl. Further, the fact that it provided no very definite outlet in vocational careers and that public examinations ignored it, made the manipulative subjects

unpopular with the average teacher. In the Manchester High School for Girls this particular estimate of Domestic Science, even when taught on lines not unlike those of the schools classed above, is very clearly emphasized by the fact that the divisions taking this work are in every case the less brilliant. The upper division is of necessity devoted to subjects of literary or examination value. This school and a few others have, however, endeavoured to raise Housecraft to a position of general education by adopting a course for examination laid down by the Joint Matriculation Board of the Northern Universities, in which Cooking and Laundry-work rank in a list with Natural Science, English, and Arithmetic. This certificate does not provide an entrance to a University as ordinary Matriculation, but is accepted for entrance to several "Training schools for teachers of Domestic Science." Probably its main value is that it creates a standard and also a goal towards which a class may be worked up. We may here draw attention to the difficult situation created in Education by the present system of examinations formulated to meet the needs equally well of either sex, and leaving little room for development on original lines. A school which must prepare girls to earn their own living is hide-bound by some circumscribed routine.

Domestic Science as a Preparation for Social Usefulness. A third factor in allowing the introduction of Domestic Science in secondary schools has undoubtedly been an interest in domestic conditions stimulated by a sense of social responsibility, together with the position women are taking in public affairs. The responsibility of Poor Law bodies towards the management of institutions, the employment of health visitors and female sanitary inspectors, together with such voluntary efforts as Schools for Mothers and After-Care Committees, have created a necessity for a more specialized interest and education in matters underlying the bulk of this work. If unconsciously, none the less certainly this has affected a section of the educational world which had previously set aside all attempts to introduce Domestic Science into the school curriculum. That a specialized training for any of these activities is outside the possibility of a school course must be evident, but that such training has in itself a specialized value has set a certain seal upon all that pertains to it. In this connection, it is interesting to note the first attempt in this country to provide a training in "Household and Social Science" of university standing. At King's College for Women, University of London, a scheme was accepted some years ago, and a course is in progress which is now housed in specially planned buildings on Campden Hill, London. These consist of spacious laboratories for Physics, Chemistry, Physiology, Biology, and Hygiene, together with a kitchen-laboratory and practising kitchens. There is a hostel attached where the students may live, and in which they are to take a course in Institutional Management. The Social Science side of the course (Economics) is taken with the above subjects, and bears very definitely on the social conditions of the country in their relation to the home. The course aims at the preparation of teachers of Domestic Science for secondary schools: health visitors, social workers, institutional housekeepers; and as a course of general usefulness, to women in their own homes and in the many voluntary agencies of the day. Her Majesty the Queen has shown her interest in this work by

allowing the hostel to be called "Queen Mary's Hostel." It was a gift from Sir Richard Gatten, the laboratories were given by Lord Anglesey, and many other generous donors have enabled the scheme to be started. The full course of study occupies the ordinary university sessions of three years, and it is hoped will eventuate in a degree. There is a specialized two years' course and also a course of one year for girls who have just left school. Diplômée teachers of domestic science may take a one year course for a college certificate.

Possibilities of the Course. A scheme of this kind has infinite possibilities. The household is the unit on which are built up many of those problems so easily classed as social, and the consideration of which is occupying all shades of reforming zeal. It should be possible to give a university course that lays the foundation of a better appreciation of these problems and makes some contribution towards their solution, while equally useful in fitting its students to control and direct their own household surroundings, thus introducing a personal element which may be considered the fundamental principle of the whole instruction. Such a question as that of "budgets" may be a useful study from the statistical aspect alone, but it becomes of very practical interest if followed through the study of foods and their values in the chemistry and physiology laboratories on to their practical destination in the kitchen, and in the provision for individual and household needs. Too often the cook knows and cares nothing of the value of her material, while the scientist has only a theoretical knowledge of its kitchen possibility. In her excellent investigation of budgets in Lambeth, Mrs. Pember Reeves showed that, in a nation of extravagant housekeepers, the extravagance of necessity increases in inverse ratio to the income, and that the "living wage" is hard to define where there are local differences that separate by as little as half a mile the scale of prices, and that household conditions may ease or hinder the housewife's tasks to a very large extent. The numerous problems of the day that are roughly classed as "Infant and Child Welfare" must eventually form a definite course of study for the student of "Household and Social Science." They are already touched upon in both the Hygiene and Economics of the course spoken of, but there is scope for a department specially endowed where the data rapidly accumulating in the medical, philanthropic, and State investigations might be collected and utilized as a basis for further instruction and research. The course, as outlined above, would form an excellent preparation for such work, and it would be possible to build up a well-organized course suited to these and other students. The child as a member of the community is already receiving attention, but the fundamental problem must be child-welfare in the home.

While the three years' course, as a foundation for specialization in an honours' course must be regarded as the ideal scheme, it has been found necessary to introduce specialization earlier and to provide the shorter courses to meet the needs of certain vocational interests.

At best, a new departure in education must for a time be tentative in character. To have secured the recognition of the London University and the establishment of two professorships in addition to numerous readerships is a triumph in itself. The facilities for research are almost unique and already

work has been done of far reaching interest and importance. The full development of these opportunities only awaits financial assistance. The outlet for those who take the course is varied, but it is not necessarily intended to provide a vocational training. The first consideration must be to provide an education liberal, inspiring, and practically useful, and in making the housewife to make the whole woman capable in her immediate surrounding and resourceful as a citizen. Some may confine their activities to their own homes or to the various fields of social work (so-called), some to institutional housekeeping, and many to positions as teachers in secondary schools.

We have laid some emphasis on this scheme, because it summarizes in a university course the collective influences which appear to be at work in directing the teaching of Domestic Science in secondary schools, and may do much to raise it to a different position as a recognized part of a liberal education. If this is to be so, it can only be accomplished by lifting the teaching from a mere means of providing manipulative tasks, or even of finding an interest for the somewhat dry paths of laboratory routine, into a course that shall develop an interest in the various opportunities for usefulness that are now open to every woman. M. R. T.

Reference—

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DOMESTIC SCIENCE, PROSPECTS OF TEACHERS OF.—(See DOMESTIC SCIENCE, THE TEACHING OF; DOMESTIC SCIENCE, TRAINING OF THE TEACHER OF.)

DOMESTIC SCIENCE SCHOOLS.—(See HOUSEHOLD MANAGEMENT.)

DOMESTIC SCIENCE, THE TEACHING OF.—Few amongst present educationists have an idea of the struggle it cost to secure that the duties of home life should be taught to the rising generation with the accuracy of science, and not left to be done by the chance rule of thumb. In 1870, when the first great Education Act was passed, Mr. Samuel Smiles (the author of *Self Help*) wrote to deplore the fact that not a single voice was raised on behalf of any branch of learning which would promote that thrift in home management so much needed by our people, adding: "Our people, *through want of knowledge*, probably waste more food than would feed another nation." On the other hand, educationists generally considered that education would be lowered in status if it included the teaching of the best methods of performing those duties of every-day life which girls would certainly (even at very early ages sometimes) be called upon to carry out. No idea of dignity was attached to the work of the Maker-of-the-Home, and schoolgirls were led to think that such matters should be quite left to their mothers. It was not until philanthropists and other leaders in public welfare awoke to the fact that a vast economic loss was entailed upon the nation through ignorance of the most elementary principles of household management, of thrift and of sanitation, that all objections were dropped, and opposition was changed into hearty and substantial co-operation.

The Royal Commission on Education laid down two principles—

1. "That the true object of education is to give

such instruction to the scholars as will best fit them to fulfil the ordinary duties of the life to which they are most likely to be called"; and

2. "That it is a duty to encourage such training in schools in matters affecting their daily life as may help to improve and raise the character of their homes."

Then at last it was realized that practical education was a great national want.

Scope. In 1881, the Board of Education (then called the Education Department) placed Cookery in the Code, with a grant. Henceforward, Domestic Science gradually developed in all its branches, and is now an integral part of all systems of education—elementary, technical, and secondary. Seldom, if ever, is any school, college, or institute now built without special arrangements being made for practical instruction in one or all of the subjects for which grants are given by the Government. Even for men and boys, Cookery has been found both desirable and acceptable.

The practical subjects recognized with grants in the elementary schools are: Cookery, Laundry-work, and Housewifery or Household Management. A grant was to be given to each subject separately but now they are included in the general grant. If all three are combined with an amount of actual Household Management, in a house specially arranged for the purpose, a special grant is made. In evening, or day technical classes, other subjects besides those named above are accepted for grants, viz., Home Dressmaking, Domestic Millinery, Household Sewing, Hygiene, Care of Infants, etc. Grants are now made on condition of attendance of not less than twenty hours. In the *day* technical classes, grants are made of 40s. for 200 hours' attendance, or 60s. for 600 hours' attendance. All these regulations are, of course, liable to change whenever new codes are issued.

Training Schools. Certain colleges or training schools of Domestic Science are recognized by the Board of Education as suitable for Government grants, and from these the teachers in any kind of school which itself receives Government grants must be drawn. These are to be found in accessible positions all over the kingdom, viz., in Bath, Bristol, Cardiff, Gloucester, Leeds, Leicester, Liverpool, London (National Training School, Hampstead National Society School, Battersea Polytechnic), Manchester, Newcastle-on-Tyne, Preston, and Sheffield. In all these, diplomas are issued after training, and examinations according to regulations laid down by the Board of Education, which provisionally endorses them. If, after two years, His Majesty's Inspector reports satisfactorily upon the teacher's work, the endorsement is completed. The training was taken formerly in single subjects, and a diploma awarded for each separately; but in 1915 a new regulation was issued for a two-years' course on a new method, Cookery, Laundry, and Housewifery being combined, with one examination and one diploma including all three which qualifies to teach in elementary schools. Most schools provide instruction for a third year, so that teachers can qualify for work in technical and secondary schools, or on the staff of a training college or school. The training is divided into three terms in the year. At present, by the regulation of the Board of Education, students are only admitted in April or September. The fees for the training are arranged by the local committee or managers of each individual school. Candidates for

training in any of these recognized schools must be at least 18 years of age, and must pass an entrance examination, in English subjects, of the school selected, unless she has already passed the Senior Local Examination of Oxford or Cambridge; the Matriculation Examinations of London, Wales, Durham, and Bristol; the examinations of the Joint Matriculation Board of the Universities of Manchester, Liverpool, Leeds, and Sheffield, etc. The training demands good previous education, and students who have not already studied Chemistry and Physiology are advised to go through a course of Elementary Science previous to entrance, as the scientific knowledge which underlies all these practical everyday matters forms a large and very important part of the study required. Besides acquiring practical skill, the students spend eighty hours in actually teaching the subjects in elementary schools, and in this connection go through a course of lectures and illustrations on "Method and Education," and upon other kindred arts and sciences bearing on the main subjects. As regards subsequent employment, there is probably no profession that brings such quick returns as that of Domestic Science. All teachers are eligible for a pension after thirty years of service. The subject is still in its growing years. Schools and centres are always increasing, and good teachers constantly in demand. The largest requirement of course, is for elementary school work, as it was for the people that the scheme was originally initiated; and it is for them that the Government gives grants both to the training colleges and the public schools as well also to the individual student in training to become a teacher. In both elementary and technical schools, the teachers are required to give ten lessons a week, two a day for five working days, at times most convenient for the locality. Organizing teachers are much in request, especially in country districts; in large town districts, superintendents are absolutely necessary. Staff appointments in training colleges and schools are desirable posts, with constantly increasing salaries. The principalship of a training school is a very responsible position, and ought always to be held by a trained lady, as arranging practical work require very different experience from that of organizing classes of literary work only. The prizes of the profession are the Government Inspectorships, which need also to be held by ladies who, by practical experience, can estimate the value of the work done in each department and by each student. These posts carry with them the advantage of a Government pension. With all these possibilities, the profession of teacher of Domestic Science offers an excellent calling for ladies of education and position.

F. L. C.

DOMESTIC SCIENCE, THE TRAINING OF THE TEACHER OF.—The importance of Domestic Science in the curricula of girls' schools is being more widely realized every year, and training colleges for Domestic Science teachers are arranging schemes for preparing teachers on scientific and modern lines.

The courses of training in Domestic Science vary in length. The shortest course covers a period of two years, but it is not advisable for teachers to take less than three years, and those who can afford to take a fourth year course of training, will be well advised to do so. The more responsible and better paid appointments in schools

are held by teachers who have taken a full course of training, and as a three-year course is an essential qualification for enrolment on the Teachers' Register, this is an additional reason why every intending teacher should take a course extending over a period of not less than three years. The Board of Education now offer tuition grants of £20 per annum and maintenance grants of £28 per annum to resident (and £20 per annum to non-resident) students who comply with certain specified conditions. Therefore substantial financial aid is available to the intending teacher of Domestic Science.

Before entering a Domestic Science training college, a student should have passed a public examination of at least matriculation standard. It will, however, be a great advantage to her if she holds a certificate of a higher standard, such as that for one of the second examinations, a list of which is given in the Board of Education Circular, No. 1166. It is hardly possible to emphasize too strongly the necessity for a good general education before taking a course of training as a teacher.

Many local education authorities offer good scholarships to students who are being trained as Domestic Science teachers. In some cases, almost the whole cost of training is defrayed in this way. Students should, therefore, find out whether such facilities are offered by the Education Authority in the area in which they reside, and prepare themselves to compete for scholarships by passing the examinations which are a necessary qualification.

The tuition fees in training colleges of Domestic Science range from about £20 to £25 per annum. The fees for residence at a college hostel vary with the type of accommodation provided, but in all cases they are extremely moderate. It is most important that students should reside at a training college hostel, for only by so doing can they enjoy the full advantage of corporate college life.

Academic and Professional Training. The training of the Domestic Science teacher falls naturally into three sections—the craft, the sciences underlying the craft, and practice in teaching. The first two sections may be regarded as the academic, and the third as the professional side of the work.

Skill in craft is developed by continuous practice in the various branches of Domestic Arts. The simpler processes are taken first, and the work is so graded that the more difficult and complicated processes are reached gradually, until finally the student is able to do practical work involving a high degree of manipulative skill.

The section of training which deals with the sciences underlying the crafts, includes Physics, Chemistry, Physiology, and Hygiene. The students attend courses of lectures and also do much laboratory work. As far as possible, these sciences are studied in close connection with the craft subjects. Students are encouraged to do experimental work, so that they may understand the reasons for the processes employed in the craft, and also that they may develop a scientific habit of mind.

The professional side of the training includes the study of Psychology and the Principles of teaching and class management. In addition to this, students are present at classes in domestic subjects taken by experienced teachers, and such classes are followed by discussion and explanation of methods. Students also give courses of lessons in schools of various types, and teach pupils of

varying ages, and in different stages of proficiency. In some training colleges, pupils have opportunities of assisting in teaching classes of adult students, and the experience they thus gain is of great value.

There are several types of three-year courses—all of which, however, include the craft subjects of Cookery, Laundrywork and Housewifery, together with the sciences which underlie the craft. Training in the principles and practice of teaching is an integral part of every course.

One type of three-year course includes, in addition to the above-mentioned subjects, Advanced Cookery with Cognate Science; another type, Needlework and Dressmaking, and a third, Science applied to Housecraft. Ample opportunity is therefore given to students to specialize in that section of work in which they show marked ability. There is a steadily increasing demand for teachers who have thus specialized, and the demand is in excess of the supply.

Salaries and Work. The salaries paid to teachers of Domestic Science vary according to their qualifications and responsibilities, and the type of school in which they are employed. The scales appropriate to Domestic Science teachers in elementary and in secondary schools have been drawn up by the Burnham Committees and accepted both by the local education authorities and the associations of teachers represented on those committees. The scales for teachers in technical schools are now being considered by a third Burnham Committee.

There are various types of teaching appointments. Students who have taken a two-year course of training usually teach in elementary schools. Those who have taken a three or four-year course, generally teach in secondary or technical schools. In such schools, great importance is attached to the scientific aspect of the work and to the correlation of Housecraft with the Physics and Chemistry which form part of the general school curriculum.

Most education authorities arrange courses of training in the various branches of Domestic Science to classes of adult students. Such courses are given in the afternoon and evening, and are usually taught by experienced teachers who have taken a full course of training. This work is very interesting and requires from the teacher great power of adaptability. Wide and varied teaching experience is, of course, essential for the position of lecturer in Domestic Science training colleges for teachers. These appointments carry with them great responsibility because the standard of work done in training colleges will be that which the students will set, as teachers, in all types of schools.

The teacher of Domestic Science whose ambition it is to hold a responsible post, may look forward to obtaining an appointment as head of a department in a technical college, or Principal of a Domestic Science training college, or organizing teacher or inspector in a county area, or Government Inspector. The number of these appointments is steadily increasing, and they are usually obtained by teachers of wide teaching experience and organizing ability.

M. E. M.

DOMESTIC SUBJECT COLLEGES.—(See HOUSEHOLD MANAGEMENT.)

DOMESTIC SUBJECTS, TEACHER OF.—Domestic subjects include Cookery, Laundry-work, and Housewifery. A teacher may be qualified in

one or more of these; and, if qualified in all, may conduct either separate, mixed, or combined courses.

A separate course in Cookery must involve forty hours attendance at the class, and at least half the time at each attendance must be assigned to practical work by the scholars with their own hands. The regulations require that each lesson should, as a rule, include both demonstration and practice. A separate course in Laundry-work lasts at least twenty hours, under the same conditions; so also with a separate course in Housewifery. Each attendance means a two hours' period of instruction, exclusive of time spent in recreation. A mixed course lasts at least eighty hours. These times were formerly prescribed in the Regulations of the Board of Education, when special grants were paid for this work, but they have been found to be suitable as standard lengths of courses. The only necessary difference between a mixed course and the sum of the three separate courses of which it is composed is that the same girls attend all three courses when they are mixed, whereas there may be differences in the composition of the classes when the courses are separate. Boys over 12 years of age may, with the special sanction of the Board, be registered in a cookery class. Apart from that single exception, the courses in Domestic subjects are restricted, as a general rule, to girls over 11 years of age; but, in special cases, they are open to girls under 11 years of age only provided that the number of pupils is limited to eighteen, and that the presence of the younger pupils does not diminish the value of the work for the grant-earning girls.

"A course of instruction in Combined Domestic Subjects must include Cookery, Laundry-work, and Housewifery, taught in such intimate connection with each other and under such conditions as to provide a training in the general management of a home. The greater part of the course must be devoted to practical work by the scholars. Scholars registered in a class in Combined Domestic Subjects must have previously received at least one full course of instruction in both Cookery and Laundry-work, or at least one full mixed course of instruction in Domestic Subjects."

The number of scholars registered in a class must not exceed eighteen.

The regulations make it clear that the Board of Education wishes to bring the separate courses into closer connection with each other. Up to 1915, it was possible for a teacher to hold a diploma in Cookery only, in Laundry-work, or in Housewifery only. More recent Regulations show that the Board desires teachers of Domestic subjects to be able to teach any of the three subjects: Cookery, Laundry and Housewifery.

The salary of a fully qualified teacher of Domestic subjects is, in most areas, equal to that of a certificated assistant teacher, viz., a minimum salary of at least £150, increasing by £10 annually to at least £240.

The tendency of the Board's Regulations is to make the Domestic subjects teacher more highly qualified in her special work; but even the recently issued "Regulations for the Training of Teachers of Domestic Subjects" do not provide that the intending teacher shall have that intimate knowledge of the present home life and the probable future home life of the girls which is the necessary foundation of genuine success in the work.

The demand for practical instruction in

elementary schools, which is clearly stated in the Education Act, 1918, shows that in future Domestic subjects are to be regarded as part of the usual curriculum for girls in elementary schools. The training of teachers of Domestic subjects will, in future, approximate closely to that of any other teacher. An interesting experiment in the preliminary training of Domestic subjects student teachers has been devised in Bradford, under the following regulations—

"The student teacher will attend an elementary school for four or five half-days per week, and will learn the principles and practice of teaching on lines similar to those suggested for ordinary student teachers, but with reference only to Arithmetic, English, Hygiene, Needlework, and Drawing.

"The student teacher will attend with a group from her elementary school, for not more than two half-days a week, in order to observe the teaching and practise the Housecraft. During the first four months of the year, she will attend the Laundry Centre; during the second four months, the Cookery Centre; and during the last four months, the Housewifery Centre.

"Records of the work done must be made as with ordinary student teachers.

"The student teacher will attend the secondary school, at which she was a bursar, for four half-days per week. Her work there will be devoted to English and Science, and to one or more of the following: Needlework, Drawing, Domestic subjects."

Intending teachers of Domestic subjects must be trained in a training school approved by the Board, and must prove themselves to have acquired skill both in Housecraft and in teaching before being awarded a diploma. There seems to be every possibility that the value of the work in Domestic subjects will steadily increase, both because of the improvement in the scope of the training course, and because of the ever-increasing interest in the work which is shown by all concerned in the education of girls.

A. C. C.

DOMESTIC WORK, BUILDINGS FOR.—(See BUILDINGS, SCHOOL)

DOMESTIC WORK FOR RURAL SCHOOLS.—

The decade preceding 1914 witnessed an educational movement in the direction of "learning by doing."

In rural schools, this took the form of Cookery, Laundry-work, House Cleaning, and Elementary Nursing.

The difficulties which confronted the pioneers of this new subject were many. The buildings, except in rare instances, had never been designed for anything beyond instruction in the "three R's"; the staffs were inadequate, most rural teachers being in charge of two or more classes simultaneously. Many local school managers often exhibited either apathy or suspicion respecting any innovation.

Difficulties have been surmounted in many ways. Some authorities employ peripatetic instructresses, who visit certain schools at regular periods. Other authorities send with the instructress a fully equipped travelling van, which spends periods of varying duration at allotted schools.

In some counties, domestic work is taken with older girls by one of the ordinary staff, while other pupils are grouped for such lessons as singing. It is possible in some schools to adapt a classroom for cookery. In other villages, a special building has been erected to serve for domestic work as well as

practical work for boys. In some instances, a cottage, or a cottage kitchen, has been hired. Under the Education Act (1918), domestic work will receive a great impetus, it will be a main feature of the central rural schools, and each county will doubtless possess a special county organizer of domestic instruction.

P. H. A.

DOMINICAN ORDER, THE.—The Order of Friars Preachers or Dominicans was founded A.D. 1216, and was instituted "principally for preaching and for the salvation of souls." But by "preaching" was understood all teaching which made for the salvation of souls. Hence the Order was distinctly academic in character. John the Teutonic, one of the early Generals of the Order, describes the Friars Preachers as men "whose proper work is teaching." So marked a feature in Dominican life was this devotion to teaching, that St. Dominic has been described as "the first minister of public instruction in modern Europe."

Scope and Basis of Instruction. The conventual schools formed the basis of the Preachers' educational activity; but they established a *Studium Generale*, as it was called, at St. Jacques, in Paris. By 1248, similar *Studia* had been opened at Oxford, Cologne, Montpellier, and Bologna. The teaching in these *Studia* was primarily theological and, therefore, Biblical; but the ancillary sciences, as they were termed, soon found a place; and, by 1260, *studia naturalia*, or courses of natural science, were instituted. So, too, the General Chapter, held in 1315, ordered that the Moral Sciences should be taught. For the furtherance of true Biblical study, and with a view to the conversion of the heathen, the Chapter of 1236 ordered that all Provinces of the Order should learn and teach the languages of the neighbouring districts. This was especially the case in Spain, where *Studia* for the cultivation of Arabic were established at Barcelona, Murcia, Valencia, and Tunis. The same was done for Hebrew and Greek. Hence, Molinier was able to say, in 1884, that the Friars Preachers "added an entire order of studies which no other Christian schools seem to have taught." The Bible was the basis of their theological teaching, hence the first care was to secure correct texts. This led to the formation of *Correctoria*, or lists of passages, where the current Latin Bibles needed correcting; also of *Concordances*, of which the Dominicans were the originators, under the guidance of Hugh of Saint Cher. Similar but simplified Concordances were drawn up by the Dominicans at Oxford. It would take us beyond our limits were we to attempt to set forth the products of Dominican activity in Theology, Philosophy, Apologetics, etc. Still, it must be borne in mind that their schools were public: they were universities which both cleric and lay could attend. They thus became the foremost general educators of their day, since they taught everything then held to form part of the circle of knowledge. Nor was their activity confined to the schools. The men trained there went out to preach by their pens as well as by their lips. Thus we have an immense number of volumes of Sermons, of Lives of Saints, e.g. the famous *Golden Legend* of James of Voragine, for long the most popular book of spiritual reading. They published various Catechisms, beginning with Ramund Marti's *Explanatio Symboli ad institutionem Fidelium* (1256-1257); St. Thomas of Aquin's *Expositiones of the*

Pater, Ave, Credo, and the Commandments; and culminating in the *Catechism of the Council of Trent*, in which the Dominicans had a preponderating share. It is striking to find the General Chapter of 1264 recommending a work of pure pedagogy, *De Modo docendi pueros*. In 1405, Joannes Dominici published his *Lucula Noctis*, in which he discussed the educational value of the classics. Their very position as men of learning and great teachers secured for the Preachers a large share in the direction of family and municipal life (e.g. the Florentine Savonarola). Hence it was stated in 1300 that no one knew the condition of the masses better than the Friars Preachers and the Friars Minor. The same was said of the Dominican Archbishop of Florence, St. Antoninus. Perhaps the truest test of the educational influence exercised by the Preachers lay in the rapid spread of the principles advocated by them in architecture, painting, and sculpture. It will suffice to mention such names as Fra Angelico and Fra Bartolomeo, and such shrines as those of Santa Maria Novella at Florence, the Minerva in Rome, San Domenico at Naples, at Prato, and especially at Bologna, where the wonderful tomb of the Founder of the Order compels admiration.

Importance of Educational Work. The Dominicans have thus been educators in the truest sense of the term. But the strictly formal education of youth has never been their task; theirs has been the collegiate and university life rather than that of the lycée. With the advent of the Reformation, much of their influence ceased. Their democratic principles rendered them distasteful to the higher circles on the Continent, and modern democracy cannot appreciate the solid principles which lie at the root of Dominican teaching. In recent years it has been found advisable to inaugurate in France a body of Dominicans who should devote themselves to the education of youth. This work was started by Père Lacordaire in 1852. The work flourished, but was destroyed by the persecution of 1903. The name of one of these Frenchmen, Raphael Captier, a great educationist, is indissolubly associated with the days of the Commune, when he, with four others of this Third Teaching Order of St. Dominic, died a martyr's death in 1871. Despite the troublous times of the nineteenth century, the Friars Preachers have carried on their scientific theological teaching. The French Provinces in particular have produced a galaxy of preachers (e.g. Lacordaire, Monsabre, Ollivier, and Didon). In addition, they have founded several reviews of high standing (e.g. *Revue Thomiste*, now published at Friburg en Suisse; and *Revue Philosophique*, published at Kain, in Brabant). Of special interest is the *Revue de la Jeunesse*; but the glory of the French Dominicans lies more particularly in the establishment of the great Biblical School at Jerusalem, in November, 1890: it will always be associated with the name of Père Lagrange, and with the *Revue Biblique*, which appeared in 1892. The university life of the Order has been perpetuated in the Jerusalem School; in the Albertinum at Friburg; and recently in the Collegio Angelico at Rome, where the study of sacred science is open to all.

H. P.

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DOMINICANS AND EDUCATION.—(See MENDICANT ORDERS DURING THE MIDDLE AGES, EDUCATION IN.)

DONAT.—(See BOOKS, SCHOOL.)

DONATUS, ÆLIUS.—Flourished at Rome, about the middle of the fourth century, as a rhetorician and grammarian. He wrote commentaries on Terence and on Virgil's *Æneid*. The works by which, however, he is best known are two treatises on Latin grammar, in a larger and in a smaller form. The larger form, the *Ars grammatica*, is chiefly derived from the same sources as the earlier Latin grammarians, Charisius and Diomedes (Teuffel, Vol II, p. 340). The shorter work, the *Ars minor*, is an extremely simple and brief grammatical text-book dealing with the parts of speech. In Keil's reprint (see references at end of this article), the *Ars minor* takes up twelve pages, whilst the whole *Ars grammatica* occupies forty-seven pages. From Donatus, we date the division of language into eight parts of speech: Noun, pronoun, verb, adverb, participle, conjunction, preposition, interjection. Donatus has four "genders": Masculine, feminine, neuter, and common. There are six cases: Nominative, genitive, dative, accusative, vocative, and ablative. As example of masculine noun, *magister* is given; for a feminine, *musa*; for a neuter noun, *scamnum*; and for a noun of common gender, *sacerdos*.

Significance. The significance of Donatus is understood when we note that from c. 350 to c. 1500 (i.e. for over 1,100 years) Donatus reigned supreme in the schools as the preparatory Latin grammar. It was written whilst Latin was still a spoken language, and, as written, was one of the simplest of grammars. But it gathered glosses, instances of which can be found in Thurot's *Notices et Extraits*. The best known commentator on Donatus was Remi (Remigius) d'Auxerre, who wrote commentaries in the end of the ninth century on both Donatus's grammars. Another of the commentator-popularists of Donatus was Isidore of Seville in the *Origines* (Book I, Chaps. XXXI–XXXVI). After the twelfth century, other earlier commentators were disregarded (Thurot). The *Ars minor* or *Donatus minor* was used, furnished with questions and answers; and the third book of the *Ars grammatica*, which came to be known as the *Barbarismus* from the object of the opening section. The remaining sections deal with Soloeismus, Metaplasmus, de Schematibus, and include many illustrations from classical writers, particularly Virgil. Out of about one hundred quotations for illustration of grammatical usage, eighty are taken from Virgil. Whilst the Renaissance introduced competitors with Donatus as the beginners' Latin grammar, the older grammarian was in evidence; and it is said that the *Ars minor* still "lingers in some parts of Italy as a useful book." In the sixteenth century, one of the editors of the *Ars minor* (published as late as 1577) was Leonard Culman, who also collected and published a book

of *Sententiae pueriles* (Children's Sentences), which John Brinsley and Charles Hoole translated into English for use in English schools. The name of a "donat" was given to a grammar, or even to an introduction to a subject. It is so used by Chaucer and Langland; also it was so used in Latin and in French. Bishop Pecock calls his text-book of religion a "Donat into Christian Religion."

Sir Thomas More says: "After the Psalter, children were wont to go straight to this Donat and their Accidence, but now they go straight to Scripture" (English Works: p. 921).

John Colet called his elementary grammar *Coliti Æditio* (as Lupton suggests) in imitation of the second part of Donatus, known as the *Donati editio secunda*. F. W.

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DON QUIXOTE FROM AN EDUCATIONAL POINT OF VIEW.

In the mind of its author, Cervantes, *Don Quixote* took birth, not only as an artistic, but also as a pedagogic and educational work. In fact, his purpose was to banish the romances of chivalry from Spain, the reading of which he believed to be pernicious. His story, moreover, is interwoven with didactic discourses and counsels of practical worldly wisdom in the conduct of life; and, as is so frequently the case in classic Spanish literature, its didactic is surpassed by its aesthetic value.

Although it was the avowed intention of Cervantes to banish the works of chivalry, which already had begun to lose favour with the public, he yet composed a work which for no other quality than for its artistic value—since in no other way could he have banished them—proved to be the last and most excellent of them all. *Don Quixote* is the culmination of the romances of chivalry and the consecration of the knightly ideal, in so far as its eternal content is embodied therein. *Don Quixote* alone placed the ideal of chivalry where it ought to be placed—in the field of an unattainable vision, a lodestar to lead our strivings onwards: it is its purity and elevation of purpose which gives the history of *Don Quixote* all its educational value.

"Be ye perfect as your Father which is in heaven is perfect," said Jesus. Thus placing before us a rule of perfection which is unattainable; and thereby He taught us the value of a Utopia. And Don Quixote's vision of perfect chivalry, and of pure justice and pure chastity, was unattainable. From

the clash of its pure teachings with real life, arises that comic element in *Don Quixote*—a comic element with a tragic undercurrent, and for that reason more educational. For *Don Quixote* is a tragedy—the tragedy of human aspirations. It is the twin sister of that other Spanish tragedy, Calderon's "Life is a Dream" (*La Vida es Sueño*), where we are taught that doing good is not a vain thing, even if it be but a dream.

To that feeling of reproach and censure which *The History of Don Quixote* evokes in many minds—the less pure and elevated minds—may be contrasted that sense of nobility which the term "Quixotism" conveys to nobler spirits; for to say of one that he is quixotic is an implication of praise rather than of blame.

Lord Byron (*Don Juan*, XIII, 11), who charge Cervantes with having "smiled Spain's chivalry mad," says that since Cervantes's day, Spain has seldom had heroes. But he mistook effect for cause. Cervantes was the poet of the decadence in Spain, and sang of the heroism which Spain dreamed of, without being able to realize her dream; for the Spaniard loved beyond his mortal strength. But since the days of Cervantes, *Don Quixote*, both inside and outside Spain, teaches him to love who lacks the power to love; and, above all, it teaches the loftiest of all lessons—that of facing ridicule. *Don Quixote* has redeemed the comic spirit.

The Influence of the Book. *Don Quixote* has exercised an influence over every one who has read it comparable to that which *Don Quixote* exercised over Sancho Panza; to wit, that, although mad, he forced a man of sense to follow after him. And there is no greater heroism than that of a man of sense following after a crack-brained enthusiast in his Utopian dreams. *Don Quixote* teaches us the lesson that a dose of madness is necessary if we would not succumb before the grossness of reality.

Now, *Don Quixote* is a mature book. Cervantes wrote it in the maturity of his life and genius, when past fifty years of age, and only in his maturity can the reader enjoy it to the full and assimilate its substance. It is not, indeed, like Goethe's *Faust*, a work for youth; and most assuredly it is not, like *Robinson Crusoe*, a work for children. *Don Quixote* ought not to be placed in the hands of children nor even in the hands of youths. Certain fathers of families and masters in Spain, by compelling their sons or disciples to read the book in their childhood or youth, have done an ill-service, and have prevented it being read in mature age. The young do not cherish the best memories of the book, and only remember its comic element and its more superficial qualities without penetrating to its fundamental tragedy; they remember only the tedium produced in their minds by the dialogues between *Don Quixote* and Sancho Panza, and all the didactic and discursive parts of the history.

The educational value of *Robinson Crusoe* is that it teaches the child how a man may create for himself a world of his own—but it is an external world. Its lesson is an economic one, and such was the intention of its author, Defoe. *Don Quixote* also teaches him who reads it to create a world for himself—but it is an interior world, a world of the pure spirit unrealizable in social life. And this lesson, not indeed a moral but an ascetic and anti-economic lesson, is not for childhood nor even for youth. Both books, the English as well as the Spanish, give a lesson of individualism; but the individualism of *Robinson Crusoe*, being less ethical and more

economic, has no need of other men; it is the individualism of the solitary man and, therefore, anti-social; while Quixotism is an individualism which can only be pursued in society because the quixotic ideal aims not at creating a world for oneself, as is the way of the mystics, but at changing the world of all of us in accord with a type of perfection which is seen in a vision, the purest spring of social action for the individual.

DON M. DE U.

DORMITORIES.—The question of dormitories *versus* cubicles will probably remain an open one, but the general trend is in favour of the open dormitory both on moral and hygienic grounds. Large dormitories should be avoided. "Through" ventilation should be aimed at, and the accommodation to be provided in each would appear to be not less than three nor more than eight. Needless to say, there should be a fire escape for each room. Probably the best form of bedroom would be one in which one side opened as doors (as at North Wing-field elementary classrooms), giving access to a balcony. In order to save labour, it is desirable that there should be a sanitary annexe to each dormitory, containing lavatory basins, baths, urinals, and w.c.'s. Linen stores should be conveniently arranged, and everything planned and fitted to reduce labour as far as possible. For this reason also, changing rooms should be provided on the ground floor, so that the dormitories may not be used during the day time.

G. H. W.

DORPAT, THE UNIVERSITY OF.—(See RUSSIAN UNIVERSITIES.)

DÖRPFELD.—(See HERBARTIANISM, THE LATER DEVELOPMENTS OF.)

DORT, SYNOD OF.—A conclave of Protestant divines who sat from November, 1618, to May, 1619, at Dort (Dordrecht), in the Netherlands, to consider the teaching of Arminius, which they condemned as heretical, while confirming the doctrines of Calvin.

DOUBLE IMAGES.—As we look at an object with both eyes, an image is formed on each retina. Each eye arranges itself so that the optical axes intersect at the object. If either eye is unable to do this, double vision follows, as in a person who squints. While the eyes are directed at one object, another object beyond will be seen double, as the images in the two eyes are thrown on different parts of the retina.

DOVE, WILLIAM.—Was born at Pontefract in 1812, and died at Ripponden in 1865. He was one of those able and original men who took up school-keeping with an enthusiasm and devotion which led to considerable educational progress. Without having received a very advanced education, he did much to further that of others. Kindly and genial, but firm and just, he was greatly liked and respected by his pupils. Generous to a fault, he spent freely of his profits in improving his school, or giving free board and tuition to pupils whose parents had become unable to pay. He died somewhat suddenly just as he attained the summit of his ambition in becoming the owner of his school buildings and the surrounding property. He began his educational work as a teacher of penmanship in Huddersfield, Halifax, and neighbourhood, and was most

successful. In 1837 he published *A Treatise on Penmanship*, an unusually good book. He opened a school at Ripponden, near Sowerby Bridge, Yorkshire, in 1837, and conducted it for twenty-eight years. The school was called "The Commercial College," and it was held in a house named Making Place Hall. It increased from 12 pupils in 1837 to 200 in 1860. It became famous throughout the North of England, and many leading commercial men sent their boys there. The aim of his school is plainly set forth in his prospectus for 1858, wherein he writes: "I have for the last twenty-five years marked well the course taken for educating the sons of commercial men intended for business, and have, for the greater part of that time, been earnestly labouring to bring round a better system by walking out of the old beaten track, introducing more practical, common, or every-day subjects, and at the same time endeavouring to find the nearest route to them." In pursuance of this aim, he had as teachers those who had had ordinary practical experience in their subjects, *e.g.* a civil engineer, a mill manager, an ordnance map surveyor, a professional singer, and so on. Also he drew up a "Tabular Plan of Studies," which provided distinct courses for: (1) Boys under 10 years; (2) ordinary commercial subjects; (3) superior commercial subjects; (4) mathematics and other special subjects [shorthand, sciences, drawing]; and (5) the classics. Moreover, there were two "special classes for the reception of pupils whose education from previous ill-health or other causes has been neglected"; and, in all cases, "an attempt is made to develop the leading characteristics of the pupil's mind, by special instruction in those subjects in which he manifests a peculiar aptitude." Great attention was given to the formation of character, and the boys were wisely exercised in self-government. The prospectus declared that "Corporal punishment is avoided. All complaints and offences are examined and tried weekly by a jury of pupils. The jury and foreman are elected by their fellows, under the presidency of the Principal." The boys took part in the general government of the school as banker, cashier, secretary to the pupils, librarian, general inspector, outdoor inspector, colonel, etc. (in drill); pianist, leader of singing, of band, etc. Former pupils testify that these were very real and actual functions.

H. HOLMAN.

DRAINAGE THEORY OF THE PASSAGE OF ENERGY BETWEEN NEURONES. — (See ASSOCIATION, PSYCHOLOGY OF.)

DRAMA, EDUCATION BY THE.—Before the time when man first raised himself erect on two legs and surveyed the world of which he was the destined king, Drama had started its work as one of the chief educational forces of his realm. Passing by the camouflage of flowers, and their imitation of the stars in heaven; the make-believe of vegetable fly-traps, the slowly evolved disguise in hues of foliage, sun and shadow, of the hunter and the hunted, the snake and the tiger; glancing at the sand-coloured lion or the earth-brown hare, the snow-white polar bear, the arctic fox and their friends in feather or fur, the humming bird's imitation of a ray of sunlight, the butterfly and bee whose beauty aims not at publicity; pausing a moment to contemplate the lizard and the chameleon and the trout as they don the cloak of invisibility in the speckled light of day: we come to the play-acting proper of the animal

world. Brer Fox shams dead that his enemy or his victim may approach within range of sudden and unforeseen attack; the partridge and the plover act the part of wounded birds to draw you from their nest or molestation of their young; the wolf dam and the cat educate their offspring in the rules of the kill by an elaborate make-believe of the chase and conquest of some maimed victim destined for the mid-day meal.

From these and similar instances, we pass to the concerted action of the pack, of the herd, of the flock; the manoeuvres of the cranes in mimic warfare, evolutions of the hunting hounds, the ordered flight or dance of birds. Just a step further on, we find primitive man telling the story of his love, his warfare, or his prowess in the chase by mimic representation of himself and other actors in the scene. Sometimes he is the bison; sometimes the bowman or spear-thruster; sometimes the lover; sometimes the beloved. In his efforts to teach and to learn, he represents mother, father, child, friend or foe, storm and calm, life or death, night or day; and so by many a make-believe, he slowly climbs the ladder upwards.

The wolf pack in the wild from their cathedral of dark green pines raise their anthem to the moon and stars. The hounds sit upright on their bench and sing their evening hymn to the setting sun. The sons of the morning in their dewy groves herald the approach of day, rejoicing as a giant to run his course. Man joins in with choric evolution and rhythmic music, round the tree, the altar of the sun or the tribal hearthstone of the sacred fire. There is one common effort to teach, to learn, and to express the mysteries of life. After these beginnings we quickly differentiate between the religious ritual; the story of the race or the hero, or the legend; the comedy or the tragedy of the individual, his passion, his suffering or his joy; the sympathies and antagonism between the man and the many, till we arrive at the problem play; the play with a purpose; the mystery, the morality, revue, opera, tragedy, comedy, pantomime, and the like; mimic warfare, amid ruined villages, click of pistol, effigy of Hindenburg and the Kaiser in the dug-out or trench, and the more welcome pageant of triumph in the larger hope; but, above all, stands out the drama as we know it, for an Aeschylus, a Sophocles, a Goethe, or a Shakespeare.

The Popularity of the Drama. Why has the drama been always, admittedly or not, one of the most popular methods of education? Why has many a man said: "I owe my success to the education I received in the theatre; it was the only education that I ever did receive"? Why has many a school mistress said: "This or that pupil showed no sign of any capacity of learning or intellectual effort till I took her to see a Shakespeare play"? To give a full answer to these questions would demand the gifts that shine in Aristotle and in Plato: the *Poetics* of the one and the *Republic* of the other.

Very briefly can one attempt the task in an article such as this. Phillip Sidney can help us with his dictum that drama gives noble pleasure to noble people, who thereby become nobler. Shakespeare claims to hold the mirror up to Nature, to "show virtue her own feature, scorn her own image, and the very age and body of the time his form and pressure." "I, your glass, will modestly discover that of yourself which you yet know not of." But we can never get much beyond the Aristotelian statement, that drama purges and ennobles our

sympathies and our passions by presenting their likeness in the lives of others.

The Actor. All this and more is true of the student as a spectator. What shall be said of the process as applied to those partaking in the play? It is somewhat significant that the greatest names in literature have generally been those whose genius is of a dramatic turn. When we come to consider this, it is but natural. To write properly of a star, you must be able to identify yourself with the nature of stars; and so of bird and beast, of God and man, and angel and devil. You must be able to enter into and understand the life of all created things, in order to create them properly in the land of art.

So to Shakespeare turn priest and politician, soldier and sailor, doctor and farmer, scientist and artist. In lesser degree, but in a similar manner, the child extends his being beyond the ignorant present. He enters into the understanding of the larger self; he lives in harmony with his own soul and the life-pulses of the universe. He learns the valuable lesson that his own sorrow grows lighter when he sympathizes with another's grief; his own joy greater when he rejoices in another's gladness.

Let him get out of himself—

"Out of your cage, out of your cage,
And take your soul on its pilgrimage;
Peas in your shoes and if you must,
But out and away before you are dust."

The best traditions of the actor's art have always laid stress on enlarging the student's personality so that he can and will enter into, and become one with, the Cosmic soul of the universe. It seeks to develop the fair mind in the fair body. These are the instruments of the actor's calling. The student will need the grace of movement and gesture that is the complement of power. He will need nervous energy, health, vitality, trained voice and breathing, character, self-restraint, harmony of body and mind, and soul according well, tensely knit together, vibrant with life rhythms for itself and others: the selfless simplicity that sets itself with single-minded purpose to study and express the complex life of man. The practice of a profession usually develops the qualities it most needs. The world is his book, men and women are the letters of his alphabet, his never-ending study is the words they spell.

Wise is the school of the woods—the owl and the pelican; wise is the elephant and our brothers the bear and the beaver, the builder of houses; wise were the men who invented the wheel and the grindstone, the ploughshare, and the finders of fire. Wisely they tuned their pipes to the many voices of earth and heaven, wise shall we be if we do the like in this the later day.

F. R. B.

DRAMA IN THE TUDOR COURT AND CHAPEL, ORIGINS OF MODERN ENGLISH.—Prior to the reign of the Tudors (1485–1603), there were, properly speaking, no companies of children actors. Interest in their origin and development centres about their employment in the native English drama and theatre in and through the Tudor Court up to Shakespeare.

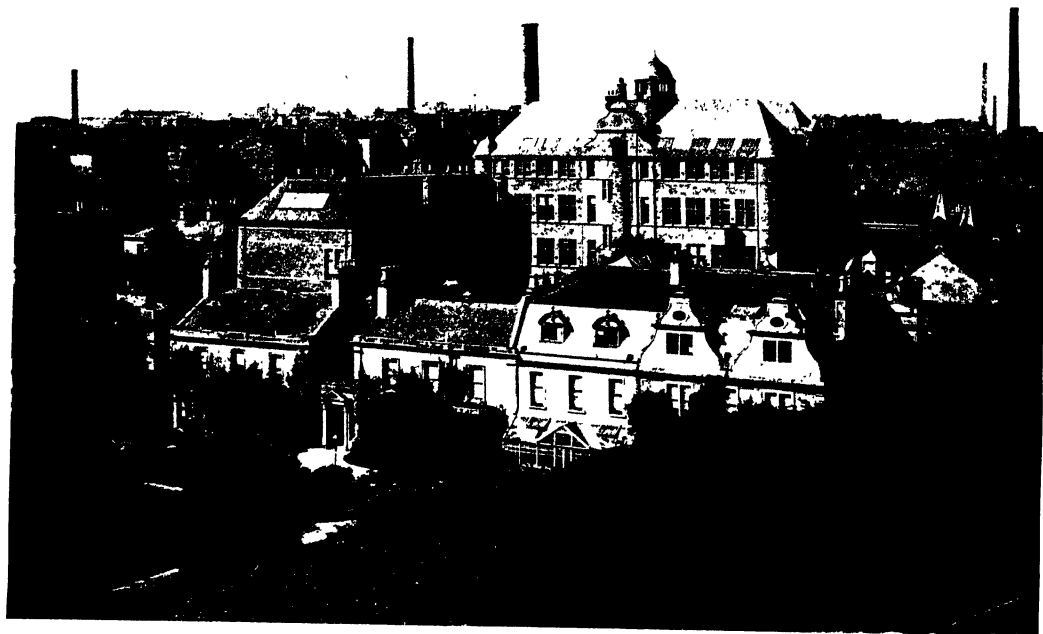
For the first time in this field we now have documentary records of final authority, which justify scholarly conclusions. The extensive new materials from ancient archives assembled by the present writer reveal the origin and development of the English drama in new aspects. They draw aside the curtain and discover to us the native English

drama as a child of the native English spirit, born on English soil and first fostered in the Court of the lusty young Henry VIII—not, as hitherto generally believed, the offspring of the Church from a liturgical ancestry. They sharply differentiate the native English drama in its steady evolution through the Tudor Court with children actors and singers, from the old non-English cosmopolite drama of Catholic Church origin, with churchmen as dramatists and actors, common to all mediaeval Europe, which, under Henry VIII, this native English genius first began to displace with the Children of the Chapel Royal as actors and their masters as dramatists.

During the centuries prior to the Tudors, the Church was the great dominant power over King and people, the shaper of all ideals. So the drama in England, as on the Continent, was religious, consisting of "Mysteries," evolved out of the Catholic liturgy, representing Bible stories, particularly the birth, death, and resurrection of Christ; "Miracles," portraying miraculous deeds done in the name of religion, particularly by saints; and, finally, "Moralities," the latest mediaeval development, in which abstractions, virtues and vices, classes, customs, etc., are represented as the *dramatis personae* in moral and religious dialogue, as, for example, Theologie, Arte, Money, Adulation, Pleasure, Swift-to-Sinne, Damnation, Satan, Pryde, Gluttonie, Learning without money, Learning with money, Money without learning, All for money, Neyther money nor learning, Moneyless and friendless, Mother Crooke, Judas, Dives, Godly admonition, Vertue, Humilitie, Charitie, and a few others in one of the latest exemplars, "All for Money," or as similarly exemplified in the better known earlier play of "Everyman." All these Church-developed dramas were devalitized, dehumanized; the dull, dreary didacticism of religion, dispensed to the people by high hands as a sort of admonitory censure upon life, under regulative and rebuking cloister-control, not the free development of any native human impulse to drama. The Church thus used the instinct for life's drama merely to religious ends.

A vital change in the life of the nation, its ideals and drama, slowly followed the War of the Roses and the enthronement of the Tudors. Peace grew permanent, learning revived, commerce spread, men prospered, King and Court loomed large, the Church began to be looked to less and Royalty more for guiding ideals; life quickened, the drama grew shorter. Still it smelt more of the cloister than of life.

Then in the midst came Henry VIII, the whilom care-free young churchman, vigorous, dashing, only 18 years old at his accession in 1509; a wild, lusty young king; unconventional, iconoclastic, self-willed, full of the "joy of life," a lover of sport, Arthurian chivalry, poetry, music, dancing, drama—action, action, action. At his Court he had about him other congenial young spirits, equally full of the "joy of life," notably, William Cornish, master of the Children of the Chapel; John Kyte, sub-dean, whom Henry later made his most powerful and life-long supporter in the Church; William Crane, another life-long friend; and other gentlemen of the Chapel, who, representing among them the art and learning and joyous life of the Court and the realm, joined the King in concocting unconventional revels around dramatic centres, embroidered with dialogue, music, dancing, and pageantry. At the very first



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Remedial Gymnastics.—Children being treated by the students at the School Clinic

Christmas revels of his reign (1509), he and ten of his jolly companions surprised the Queen by suddenly appearing in her chamber and enacting a play of Robin Hood contrived amongst them. That was the beginning of new drama, inspired by the native dramatic instinct, the play of human life.

The King had an uncontrollable instinct for acting, revelling, and jousting; and year after year at the Christmas season he was one of the principal actors and revellers in the dramas and pageant-plays and dances prepared for his pleasure by these companions. No mouldy Church-drama for him, nor even their later-evolved moralities, however shortened for public toleration. Away with them. Give him life, spicy, pungent, odorous, in this concentrated, microcosmic representation of life called drama; sheer entertainment, grave and gay alike, each heightening the other—in a word, play. Once, for example, in 1514, after enjoying one of these delightful little interludes or plays devised for him by Cornish, there was brought in a play of the old type, a morality by Meewell. But the King, disgusted with its devitalized and dehumanized cloisterliness, and unable to endure its tedious vapidty, got up and left. Never again did the old drama appear at his Court. From that time forth, the drama of Church origin was doomed; and the new drama of native, unrepressed human instinct, as he himself and his Court represented it, was destined to dominance and world-wide favour.

Out of this new spirit of King and Court, of facing life squarely and representing it fairly, came the new, the native, the humanized English drama, which made a Shakespeare possible. This development centres about the Court and the dramatic activities of the Chapel Royal inspired by the King. During the first seventy-five years of this new spirit, the dramatists that count in the evolution were the Masters of the Chapel Royal or other Court poets, the theatre was a royal hall, the actors were at first the King and the gentlemen and Children of the Chapel, and, finally, the boys of the Chapel alone. On them and their masters devolved the evolution of the English theatre and the modern English drama, which reached its climax within a century in the achievements of Shakespeare and his fellows. The part the boy actors and their masters took in this evolution has only recently been made known from contemporary records presented by the present writer, and can be only faintly indicated here.

William Cornish and the Children of the Chapel Royal. In every determinable case, the Masters of the Children of the Chapel or other Court poets were the authors of the plays they presented. Prior to Henry VIII, their early efforts at entertainment were mainly musical and lyrical, with occasional dialogued prelusions of the coming new drama, as at the Christmas "disports" of 1490, when the Children of the Chapel took the *rôle* of quaint mermaids in pageant of pantomime and song.

The first clear beginnings of the new drama and the use of the Chapel boys as actors synchronize with the beginning of the reign of Henry VIII, in 1509; and the appointment in that year of the young King's lifelong friend, William Cornish, as Master of the Children of the Chapel. Thereafter the boys, at first assisted by the gentlemen of the Chapel, and later alone, acted practically every year at the Christmas festivities and, as the chief entertainers at Court, became the centre of English dramatic evolution.

At first, the new drama had just enough dialogue to tie the action together in a theme of Arthurian chivalry; romantic rescue of ladies; the triumph of love and beauty over villainy, accompanied by frequent and elaborately set sword combats, interspersed with songs and music by the gentlemen and Children of the Chapel, and finished by dancing and revelling by the King and lords and ladies. The action was presented in some royal hall on a huge pageant wheeled in as a stage, set with castle, forest, palace, or other essential background and scenery in most elaborate fashion. From this beginning, during the first fourteen years of Henry VIII, under the mastership of William Cornish as dramatist and impresario, the play grew rapidly toward dialogue, accompanied by song, music, and dancing of charming rarity and fancy; and the pageant-frame became less and less important, finally serving its proper function of a mere stage or background for the dialogue and action. At first, the gentlemen of the Chapel and the youthful King were the principal actors, and the children auxiliaries. But the capacity of the boys in acting and singing very soon brought them to the point of acting entire plays alone or with only the auxiliary help of the gentlemen of the Chapel in physical combat or other heavy *rôles*.

That Cornish was the author of these first new plays is declared by the newly-presented records in every instance where any author at all is mentioned, and that he was the author of the rest, some of them ascribed without evidence to his pupil, John Heywood, when he was only about 19 years old, or to others, is determinable beyond question upon other evidences. Even the records for furnishings, apparel, payments, etc., which ordinarily have nothing to do with authorship, incidentally mention Cornish as author in ten instances; and every play acted by the children was presented under the sole direction of the Master, who, as in the several known cases of masters of other schoolboys following the Royal example, regularly wrote the plays they presented. A mere enumeration of these first efforts of the new, the humanized drama, developed around the Court centre with the boys as principal actors, is instructive. They were regularly acted at the Christmas season, December to January.

Entertainments before Henry VIII. 1509-1510: CHRISTMAS. Three plays, unnamed, and other disports, one being the surprise play of 18th January in the Queen's chamber, acted by the King and ten lords in kensal green, based on the fine old legend of Robin Hood and Maid Marian.

1510-1511. "Various revels and jousts of honour," elaborately staged pageant-plays, one being "Y golden arber in ye arche yerd of plesyer," with Cornish as the apparent author in two *rôles*, which was introduced at the close of an interlude by the Chapel, under Cornish, that was accompanied by "diuers freshe songes."

1511-1512. A pageant-play, "Le Fortesse Dangeurus," with knightly rescue of ladies. Cornish, apparent author, a chief actor and the director. Also two plays by the Chapel under Cornish.

1512-1513. The pageant-play of "The Riche Mounte," enacted about a mountain of gold and precious stones, in an allegory of the Red and White Roses.

1513-1514. A play by Cornish called "The tryumpe of Louc and Bewte," with song, music, Morris dance, and, for the first time, the new Italian

"meskaler" or masque. Thereafter Cornish made it a part of each new play. From this source developed the later plays with masks by Lyly, Peele, Chapman, Jonson, Shakespeare, and their associates, in which boy actors were essential. On the same night, following Cornish's pleasing new-style play, Medwell's morality on "the fyndyng of Troth who was carryed away by ygnorance and ypcresy" was acted by the King's strolling interlude players, who spent most of each year in the provinces presenting the old-style play; but the King could not endure its tedium, and got up and left. That was the last known morality at his Court. The native new drama thereafter held sway, as inspired by the King and practised by Cornish.

1514-1515. The pageant-play of "The Pavyllon un the Plas Parlos," admirably exhibiting the clear evolution toward the new drama by the use of dialogue, tourney, dance, song, and music. Cornish, the probable author, was one of the principal actors. Also other gentlemen and the children acted.

1515: 1ST MAY. The pageant of "The May" before the King as he rode a-Maying at Shooter's Hill, the whole serving as a background for a Robin Hood drama, with love in the green wood as the natural theme. The children acted and sang.

1516: 5TH JANUARY. Two performances, one a pageant-play of the Castle, with songs and the new *meskaler*, Cornish being named as author and a principal actor; the other an interlude written by Cornish and acted by him and the children, "The Story of Troylous and Pandor," based on Chaucer's "Troilus and Creseide," a fore-runner of his later Chaucerian plays hitherto ascribed to Heywood. From this time on, the pageant grows less, and Cornish's new sort of interlude increases—a happy evolution from the pageant-dialogue into little plays from life and legend and story, with songs, music, and the new Italian *meskaler* as corporate parts.

1516: 20TH MAY. A play, author and actors not named, unquestionably Cornish and the boys.

1516-1517. Two plays by Cornish and the boys. One may have been "Of Gentleness and Nobility," based on Chaucer's Wife of Bath's Tale, sometimes ascribed to Heywood, Cornish's pupil, then about 18 years old; "Colin Clout, I—II," by Cornish's friend Skelton, furnishing two lines (c. ii.). Also one pageant-play, "The Gardyn de Esperans," with songs and the new "mask" incorporated; Cornish named as author, also as actor in two *roles* and the prologue. The boys acted and sang.

1518: 6TH JULY. Two interludes, unnamed, possibly "The Four PP." (Palmer, Pardoner, Potycary, and Pedlar) and "The Pardoner and the Frere," both hitherto ascribed to Heywood, then a boy of about 19 or 20, both believed by scholars to have been acted about this time, both based on Chaucer, as were Cornish's "Troyleus and Pandor" and "Of Gentleness and Nobility," above named. Also materials for a "Palmer's Mask," suitable to these plays, are in the inventories of this year—stafis, clap-dishes, beads, scarlet cloaks, and hats, scrips, and boots of crimson satin.

1518: 7TH OCTOBER. A pageant-play, with glitter of gold and jewels, celebrating the proposed match of the Dauphin and Lady Mary in allegory, dialogue, tourney, and the usual dance.

1519: 1ST JANUARY. An unnamed play, by Cornish and the boys, followed on 7th March by "a goodly comedy of Plautus," in honour of the French—the only known example of a Latin play

by the Children of the Chapel at Court or elsewhere. Their plays were regularly in English.

1519: 3RD SEPTEMBER. A play, called "Cornish's Pastime," acted by seven of the boys—a charming allegorical fancy of summer, winter, spring, sun, moon, wind, rain, etc.

1519-1520. Three unnamed interludes by Cornish and the boys, one of which may have been "The Four Elements," in which earth, water, fire, air, etc., might have constituted the proposed "Dysgysynge," in a pretty show and dance similar to "Cornish's Pastime" of the preceding September.

1520: JUNE-JULY. By special order of the King, Cornish was the deviser and the boys were participants in the grand pageants of the Field of the Cloth of Gold in France. Both before and after this, all such Court entertainments were entrusted to Cornish.

1521: 6TH JANUARY. Cornish was paid for "his play," acted by the Children under him, possibly "Johan Johan the Husbande, Tyb his Wyfe, and Syr Jhan the Preest," hitherto ascribed to Heywood, who, on his own declaration in "The Spider and the Fle," wrote nothing until about ten years later. Cornish may have brought the plot back with him from France, since there is some resemblance between it and the slighter French "Farce nouvelle tres bonne et fort ioyeuse de Pernet qui va au vin."

1522: 4TH MARCH. The pageant of "the Shatew vert" (Chateau Vert), at York House. Anne Boleyn was one of the sixteen ladies participating, and Shakespeare represents Henry VIII as meeting her on this night for the first time, while dancing the Shepherd's Masque.

1522: 4TH, 5TH, AND 15TH JUNE. "Meskeler and revels devised by Mr. Korniche" on all three of these dates, by special command of the King to Cornish, in rare entertainment of the Emperor of Rome, Charles V of Spain. For one of these occasions, Cornish, using the popular Spanish tale by de Rojas as his source, may have prepared "Calisto and Meliboea," the high-water mark of extant English comedy up to the establishment of the first Blackfriars theatre, 1580-1584. This play, acted by boys at Court, was by Cornish and the Chapel Children under him, since no other boys acted at Court until several years later. On 15th June, Cornish and the boys presented before the Emperor at Windsor an allegorical play which he had specially prepared for the occasion, satirizing the French king. This was Cornish's last and most important performance. He died in 1623.

During these fourteen years of Cornish's master-ship of the Children of the Chapel, we note vital changes in dramatic entertainment at Court, and consequently after a time throughout the realm. The old "mummings," "disguisings," moralities, pageants, and outside companies, used by Henry VII and before, fell into desuetude at Court. The drama of Church origin was doomed. Cornish's new interlude, based on life, combining the attractive features of the new dialogue and action in the rejuvenated old pageant, the new lyric, music, dance, and the new maskeling into one pleasing dramatic homogeneity, with the Children of the Chapel as performers, became the dominant vogue of Court entertainment, and laid the foundation of the native English drama.

For the first time on English soil, drama, instinct with life, now found voice. Court conditions alone, with unlimited demands for variety of entertainment and unlimited means for carrying out any fancy, made the achievement of the beginnings of

such drama possible. Nor could Cornish have carried out such fancies if he had not had the Children of the Chapel at command to act them. Nor had anyone else his privileges and facilities for dramatic entertainment at Court, amounting to a practical monopoly under Royal direction. All plays of this new, dominant vogue were presented by him and the boys under him, and, so far as determinable, were written by him.

The Successors of Cornish. With the death of Cornish in 1523, the promising new drama dwindled. The lifelong friend of Cornish and the King, William Crane, succeeded to the mastership of the Children and held it until his death in 1545. Then Richard Bower held the place until his decease in 1561. Crane and Bower were musicians. Records show that they presented plays with the Children of the Chapel as actors at Court annually, as before; but the dramas were of a cruder vein, devoid of Cornish's quality of imagination.

The apparent lack of dramatic ability in Crane and Bower was supplied in part by Cornish's pupil and follower, John Heywood, the King's player on the virginals. But according to Heywood's own statement in "The Spider and the Flie," he wrote nothing until about 1530, ten years or so after the performance of those delightful plays hitherto erroneously ascribed to him, "The Four PP.," "The Pardoner and the Frere," and "Johan Johan." The judgment of his contemporary, Bishop Bale, himself a dramatist, that Heywood was unlearned and that his efforts in pageants, plays, comedies, and masks were but vain and foolish is amply borne out by the only plays positively identifiable as his, namely, three drearily didactic dialogues, not worthy to be classed with the interludes of Cornish which he vainly strove to imitate, namely, "Weather," "Love," and "Wytty and Wytless." Another dialogue, "Love and Riches" (1527), and a similar one on "Youth and Riches" (1552), both acted by the Chapel Royal, may or may not be his. He himself says that he "made many mad plays," but did "few good works" in his days. These light, ephemeral entertainments have perished. There is no record that Heywood ever wrote for, or was in any way associated with, any other children than the Children of the Chapel Royal.

Not Heywood, but Cornish, was the founder of the new drama, under the inspiration of Henry VIII's iconoclastic spirit, with the Chapel boys as actors. And that drama was a square break from the past. The old moralities, having served their time, perished. In modified form, they lingered on in the country by the side of this new species for half a century, growing less and less in favour as this new drama of human life, thus started, gradually evolved out of the narrow confines of the Palace into those permanent houses, the Elizabethan theatres, to the delight of the larger public.

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C. W. W.

DRAMA, SCHOOL.—The drama, like other forms of art, owes its greatest achievements to those who, here as playwrights or actors, have given it professional service. But at different periods, and for various reasons, amateurs have done much for its development. The trade-guilds, the Universities, the Inns of Court, the schools—all have an honourable place in the annals of the stage. The dramatic activity of the schools extends back to the earlier mediaeval period, when it was mainly associated with the "Boy Bishop." On the three days following Christmas—the festivals of St. Stephen, St. John the Evangelist, and the Holy Innocents—the deacons, priests, and choir-boys held their respective revels, burlesquing the offices and ceremonies of the Church. Of these mummeries, the most popular and long-lived was that on the third day, when a choir-boy, arrayed in full pontificals, occupied the bishop's stall and discharged his functions. This fantastic ritual, which was observed throughout Western Europe, can be traced back in England to at least the end of the tenth century. Many evidences of its popularity in connection with the cathedrals and their song-schools remain, though, from the beginning of the twelfth century, the festival was often associated with St. Nicolas' Day, the 6th of December. From the song-school, the "Bishop" made his way into the grammar schools. At Worcester Grammar School, mention of the festival occurs in 1291; and, when William of Wykeham founded Winchester in 1400, he provided in his statutes for the "Boy Bishop" on Innocents' Day. King Henry VI made a similar provision in his statutes for Eton in 1444, though the ceremony was to be held on St. Nicolas' Day. At King's School, Canterbury, the ceremony was observed on St. Nicolas' Day in the middle of the fifteenth century, for its omission in 1464 is censured by a contemporary chronicler. At the end of the century, Archbishop Rotherham, who had provided a college at Rotherham, his native place, left in his will a mitre for the "barne bishop."

Colet, in his statutes for St. Paul's School (1518), did not provide for a "bishop" in the school; but directed that the boys should go on "Childermas Day" to the cathedral, and there hear "the child bishop's sermon," and each of them offer him a penny. But, in 1541, the "Boy Bishop" was abolished by royal proclamation, and, except for a brief revival in the Marian period, he disappeared both from church and school.

It is curious that there is so little record of the participation of schools, even choir-schools, in the acting of miracle or morality plays. The only performance of which there is definite evidence was at Dunstable School about 1110, where the Norman, Geoffrey, wrote a play for his pupils on St. Catherine, and borrowed some choir copes for the occasion from the sacrist of St. Albans, which, unfortunately, were burnt on the following night. Doubtless there were other religious plays in which schoolboys acted, and these may have been partly intended for edification. But, as a whole, the dramatic instinct in mediaeval schools was turned to frankly recreative purposes.

Plays in the Classical Languages. With the Renaissance came the conversion of the school play into an instrument of education. Latin had been the *lingua franca* of mediaevalism, but in a barbarous and corrupt form. The humanists sought to revive the speaking and writing of the language in its classical eloquence and purity. For this

purpose, they looked upon the study of the Roman dramatists, especially Terence, as of the greatest importance. Vives, Melancthon, Luther, and Erasmus (*qq.v.*) urged that Terence should be constantly in the hands of schoolboys; and Wolsey, in his statutes for Ipswich School (1528), required that particular attention should be paid to his plays. In 1535, Nicholas Udall (*q.v.*) published *Floures for Latine Spekynges*, a phrase-book for school use gathered from three of the comedies.

It was a short step, especially in an age of intense dramatic activity, from the reading of the Roman dramatists to the acting of their plays. Sturm (*q.v.*), when he was Rector of Strassburg Gymnasium (1536–1581), encouraged the performance of both Greek and Latin plays, and was anxious that the whole of Plautus and of Terence should be acted every six months.

The first recorded performance of a Roman comedy by English schoolboys was on 7th January, 1528, when the scholars of St. Paul's, under their master, John Rightwise, acted the *Phormio* at Wolsey's house before the king and all the foreign ambassadors. A performance of the *Menæchmi* in similar circumstances, in the previous year, had been by "the Cardinal's gentlemen."

Other performances of Roman comedies will be noticed below, but various causes soon led to a widening of the school dramatic repertoire. The morality of Plautus and Terence was, unfortunately, by no means so pure as their Latinity, and even teachers who were far from prudish hesitated to place them in the hands of ingenuous youth. Hence arose a group of dramatists who sought to apply the language and methods of classical writers of comedy to more edifying material, taken mainly from the Bible. This neo-Latin type of school-play flourished especially in Holland, where in the first half of the sixteenth century a brilliant series of playwrights wrote comedies adapting the story of the Prodigal Son to the conditions of Renaissance school and university life. These included the *Acolastus* of Gnaphaeus, the *Asotus* and *Rebelle*s of Macropedius, and the *Studentes* of Stymmelius. As their most vivid scenes depict the dissolute courses into which their youthful heroes stray, their general effect is not much more decorous than that of Roman comedy itself, but this only added to their popularity throughout Europe.

In England, *Acolastus* and *Asotus* were acted at Trinity College, Cambridge, in 1560–1561 and 1565–1566; and, though there is no record of a school performance of them, it can scarcely be doubted that such took place. In any case, *Acolastus* became accessible to English readers in 1540, in John Palsgrave's translation of it, "after such manner as children are taught in the grammar school." It probably helped to inspire the English Prodigal Son plays, such as *Nice Wanton*, *Misogonus*, and Gascoigne's *Glasse of Governement*, though none of these can be definitely assigned to schools.

The Prodigal Son was not the only Biblical subject of school-plays. Thus, at Hitchin, the pupils of Ralph Radcliff, as Bale relates, acted plays written by him on Lazarus, Judith, and Job. Radcliff also wrote comedies on romantic subjects, such as *Griseldis*. These have all been lost, as has Rightwise's Latin tragedy, *Dido*, acted by his pupils before Wolsey "with great applause"; and his "disguising or interlude" in French and Latin, satirizing "the herrytyke Lewtar," with which the St. Paul's boys, on 10th November, 1527,

entertained the French nobles who were visiting the Court. In 1538 the boys of Eton, where plays were acted at least as early as 1525–1526, appeared under Udall before Thomas Cromwell.

Plays in the Vernacular. The practice thus begun of employing schoolboys to perform before great personages gave an impulse to school drama that was far from strictly educational. Cavendish states that the apparel in Rightwise's interlude "was of such exceeding riches," that it passed his "capacity to expound." It was inevitable that, when school performances were given at Court, the mounting and costumes should receive special attention. Under Elizabeth, these performances became an institution, and there can be little doubt that they had an important effect in stimulating the writing and acting of school-plays in the vernacular instead of in Latin. The Queen could fully appreciate a classical or humanist drama, but many of her lords and ladies had as "poor a pennyworth" in Latin as Portia had in English.

Hence, school drama became increasingly bilingual. If, as is probable, Udall wrote *Ralph Roister Doister* for his Westminster pupils soon after his appointment as head master, about 1553, English plays must have been acted there in Mary's reign. When Elizabeth re-founded the School in 1559, she ordained that a Latin comedy or tragedy should be acted annually within twelve days after Christmas. Hence it is natural to find "the children of Westminster" performing the *Heautontimoroumenos* and the *Miles Gloriosus* at Court in January, 1564. But when they appeared before the Queen during Christmas, 1567–1568, and on New Year's Day, 1574, they acted English plays.

At Eton the performance of school plays was continued in the reigns of Edward VI, Mary, and Elizabeth. English as well as Latin plays were acted; and it is probable, though there is no direct evidence, that the performance before the Queen at Hampton Court on Twelfth Day, 1573, by the "Children of Eton," under Elderton, was in the vernacular.

A vigorous Elizabethan newcomer into the field of school drama was Merchant Taylors', founded in 1560–1561. Mulcaster's "children" acted before the Queen in 1573–1574 (on Candlemas and Shrove Tuesday), and in 1583, when they performed *Ariodante* and *Genevora* based on an episode in the *Orlando Furioso*. But the vogue of the school play was far from being confined to the capital and the area of royal patronage. At Canterbury, the Cathedral Chapter were generous supporters of the performances by the scholars of King's School, where from 1562 onwards there was great dramatic activity. Sandwich was another Kentish school where the Christmas play was an institution. In Hampshire, school plays were acted during the later sixteenth century at Winchester, Salisbury, and Southampton, and at Corfe in the Isle of Wight. In the north the chief centre was Shrewsbury, where a quarry near the Severn formed a natural open-air theatre. Here, under Thomas Ashton, head master of the newly-founded grammar school from 1562 to 1568, the boys acted a number of plays on Biblical subjects, written by Ashton himself. The Corporation contributed to the performances, and very large audiences were attracted. Other northern schools at which plays were acted were Beverley and Penrith.

Educational Aims and Results of School Drama. Our records, imperfect as they are, thus testify to

widespread dramatic activities, which must have had important educational results. Even if boys did not realize the full humanist ideal by learning to speak or write Ciceronian Latin, they gained a working knowledge of the language, and a sense that it had been, and still was, a living instrument of human intercourse. They learnt—and this in itself was worth much—to associate the classics not merely with the toil and discipline of the classroom, but with the relaxation and festive spirit of the holiday seasons. Through Latin and vernacular plays alike came the training in elocution, gesture, and self-confidence, in which the English schoolboy is so often deficient.

The school-plays had also important effects on the development of Elizabethan and Stuart drama. Terence and Plautus, and their humanist imitators, could not be constantly acted without an infusion into vernacular comedy of classical influences. The *miles gloriosus*, the pedant, and the parasite as dramatic types; the division into acts, and a heightened sense of style are among the debts owed by the amateur stage to Roman comedy, and passed on by her to her professional sister. And what a stimulus to dramatic genius or talent must the school performances have given to Marlowe at Canterbury; to Kyd and Lodge at Merchant Taylors'; and Gager, Cartwright, and Cowley at Westminster! Above all, these performances familiarized thousands of Englishmen from their early years with the stage, and gave them a permanent interest in it.

It was just this, as Puritanism grew stronger under the Stuarts, that aroused hostility to the school-play. In Ben Jonson's *Staple of News*, III, ii, Censure cries indignantly that the schoolmasters "make all their scholars play-boys. Is't not a fine sight to see all our children made inter-luders?" Hence, when, in 1642, Censure and Zeal-of-the-land Busy triumphed, the day of the school-play was over. The professional theatre, catering for the entertainment of the Court and the town, could revive after the Puritan interregnum; but for the academic stage there was no true place in a world of changed social and educational ideals.

Yet it did not entirely disappear, and there was even one direction in which, partly owing to the influence of Comenius, there was something of a new development. The distinctively pedagogical play, which handled some subject of the school curriculum, had increased vogue. The popular Oxford play, *Bellum Grammaticale*, written by Leonard Hutten about 1583, in which the irregularities of Latin accidence were dramatically illustrated, was revived in adapted form at Cranbrook School in 1666, and at Tonbridge in 1718. Another Latin grammar play, *Words Made Visible*, was acted "by the Lads of a County School," and published in 1679. In 1723 a dramatized *History of England* was performed at Holt Grammar School.

Bellum Grammaticale was also revived at King's School, Canterbury, under the headmastership of George Lovejoy (1665–1684). During his rule the boys gave a remarkable series of performances, including various Cambridge comedies and plays by Shirley, Dufey, Settle, and Dryden. The acting by schoolboys of works produced on the professional stage was an extraordinary departure from the original aims and ideals of academic drama. It was a further innovation when, in 1743, the King's

School scholars performed Addison's *Cato* in the public theatre of the city.

English plays written for the professional stage were also acted by the town boys of Westminster. For two of these, Dryden's *Cleomenes* in 1695, and Otway's *The Orphan* in 1720, special prologues were written by Prior. The King's scholars, however, remained faithful to Plautus and Terence, though on five occasions—between 1712 and 1793—the most famous of Cambridge Latin comedies, George Ruggle's *Ignoramus*, was added or substituted. From the beginning of the eighteenth century a new attraction was provided in the annual original epilogue, dealing, as a rule, with contemporary affairs. This doubtless helped to keep the Westminster play alive during the period from the middle of the eighteenth to the later years of the nineteenth century, when school drama in England was elsewhere almost dead.

But the general dramatic revival that dates from the close of the Victorian Age, and the increased recognition of the importance of spoken language in the educational curriculum, have recently combined to give a renewed vogue to the school stage. At Bradfield, Greek plays have been performed under conditions akin to those in the open-air Greek theatre. At the Perse School, Cambridge, the plays written and acted by schoolboys are a development of the "direct method" of teaching languages, classical and modern, which has been a prominent feature in its work. At many other schools, secondary and elementary, plays and colloquies are being increasingly used for purposes of speech-training, or to vitalize the teaching of literature, history, and other subjects. In spite of defects and dangers to which it is liable unless skilfully directed, school drama seems likely to regain something of the educational importance that it lost after the triumph of the Puritans.

F. S. B.

DRAWING FOR CHILDREN, THE EDUCATIONAL ASPECT OF.—Drawing is one of the instinctive methods of self-expression of children, and is, therefore, a subject of considerable educational value. This article deals only with what is commonly called "pictorial drawing," because that is the branch now generally recognized in schools. From the educational point of view, it is unfortunate that decorative (applied) art is not included in the curriculum, for it is of even greater value in teaching good taste than pictorial drawing; it also gives scope for invention and ingenuity, and admits of sound correlation with other subjects.

The development of children in graphic expression is similar, in some respects, to that of certain nations in the past. Marked stages of transformation are conspicuous in their progress, a fact which suggests that the teaching of the subject should proceed from the analytic to the synthetic.

For the sake of clearness, their development is here divided into three stages—

1. Free self-expression (young children).
2. The desire to make things look *real*.
3. The ability to draw with more structural accuracy and decision.

Free Self-expression. Free self-expression characterizes the period when direct teaching is not required, though encouragement and suggestions should be given by the teacher. At this stage, children draw to express some idea in their own minds, regardless of proportion, perspective, or

relief. These early drawings are *symbolic* and *decorative*. Symbolic, in that young children learn certain forms and apply them to certain objects: thus the circle represents heads of people and animals, the ellipse, the body, and so on. In addition to these symbols familiar to us all, they introduce some of their own, in order to understand which the spectator has to ask what such and such a symbol means. Young children take this inquiry as no slight upon their drawing, whereas later on they would do so. Such drawings are decorative in that they show flat treatment, dividing lines, and processional style, all of which features are, broadly speaking, characteristic of decorative art. This tendency is best shown when they are illustrating some story; for example, *Little Bo-peep*. They draw their picture on a horizontal line, processional style, with flat colour and dividing lines. The sheep appear off the grass, the sky at the top of the picture, a profile view of the body is given with full view of the eye, and the arms appear to be growing out of the neck; then, as the draughtsman develops, the arrangement on a horizontal line becomes less marked, sheep are drawn on the grass, the sky is not so strictly relegated to the top of the picture, the drawing of the eye becomes more consistent with the view of the body, and the arms approach nearer to their normal position. Should the subject to be illustrated include a house with internal and external interest, then young children show the inside and the outside on the same drawing. Further, a tree and a flower or two often represent a landscape or a garden; important people are frequently drawn on a larger scale than less important ones. As the children advance, these latter characteristics, also, give place to more developed methods of expression.

In connection with this stage, it may be noted that graphic art in her infancy was symbolic and decorative; and many of the characteristics and signs of development just described in children's work occurred in early Egyptian, Byzantine, and Italian Art.

Making Things look Real. When children show, either by manner or by words, such as "It doesn't look real" or "like it," that primitive methods of expression give them little satisfaction, it is a sign that they are at a transformation stage. This is the moment where it is necessary to understand that the educational value of drawing consists largely in teaching children to observe the right thing at the right time; they may even begin to dislike drawing unless taught to see that the effect of realism is produced by gradation in tone. Once they observe this, fresh mental activity is aroused; this brings keen interest into their practical work, because they know what to *look for* and *express* if their drawings are to look "real." A great many failures are due to lack of knowledge of what to look for.

Attempts at expressing gradation in tone will be crude at first; but so long as the children's drawings show that they are trying with sincerity to express the object before them, graphic and moral development of the right kind is taking place.

It is interesting to note that in the Italian School of Painting the symbolic and decorative styles ceased to satisfy after about the thirteenth century, when Giotto (1276-1336) went to Nature for information, and discovered that the effect of "relief" in drawing was produced by gradation in tone. This led him to systematize the laws of

light and shade. His discovery aroused a keen desire for realistic expression, and brought about great progress in graphic art.

Accuracy and Decision. A period next comes when children can draw with better appreciation of light and shade, greater structural accuracy, and more decision. They must be taught that these qualities are essential to advanced work. They are now capable of learning perspective and tone values; this arouses fresh interest in the drawing class, for it allows the introduction of groups of models and more difficult subjects, and teaches children to understand how valuable scientific knowledge is in graphic art. Thus, step by step, they are trained to understand that the drawing of things in proper relation to each other, with a background in *good* proportion, light and shade, and perspective, is indicative of the highest stage of development in graphic art.

In the Italian School of Painting, after Giotto's death, graphic art practically stood still for a time and the plastic arts made headway, with the result that in the fifteenth century objects were drawn showing more solidity and greater knowledge of light and shade. This suggests that the teaching of clay modelling in schools is valuable in that it gives children a better idea of form, and enables them to express the third dimension with more decision when drawing.

The scientific side of drawing developed rapidly in the Italian School about the fifteenth century, owing to Uccello's (1390-1472) systematizing the science of perspective, and to Pallainola's (1426-1496) interest in the anatomy of the human figure. From this time, great advancement was made in the power of representation, showing figures in proper relation to a background, good structural drawing, and study of character and action.

If drawing-lessons, then, are to be of educational value, the teacher must note that, as their mental and physical abilities in graphic art successively appear, children pass gradually into more advanced stages. While watching the transformation periods, the teacher must follow up the result of his observation by continuous and systematic teaching, gliding, as it were, from one stage into the next; teaching the children that, if they observe the things around them intelligently at the right time, and then as a result of their observations try to *do* something, they are establishing a principle that will be useful in every branch of life after they leave school.

E. S. A.

DRAWING, HISTORY OF THE TEACHING OF.

—The anthropologists point to the use of drawing by prehistoric man. The development of painting by the Greek artists sufficiently indicates long training in drawing. Modern writers usually date the historic treatment of drawing back to Aristotle, who placed *γραφική*, which included writing, drawing, limning, and painting amongst the curricula of generous exercises of youth in a well-governed commonwealth. Amongst the Romans, the subject was held in honour, as, for instance, Quintus Fabius was pleased to add *pictor* to his name. In the Middle Ages, drawing in the developed forms of manuscript writing and the illumination of MSS., received due training in the scriptoria of the monasteries. The drawing of maps for geographical purposes was a minor, but by no means negligible, form of educational work in the Middle Ages; and the first plea for drawing in modern England was that of Sir

Thomas Elyot, in 1531, in the book called the *Gouernour*. Up to his time, in England, drawing was mainly regarded from a utilitarian point of view. But Elyot urges that children drawn by Nature "to paint with a pen, or to form images in stone or tree, should be instructed and trained to draw." He, too, insists on the usefulness of drawing for designing engines of war, for survey of countries (our own, and that of an enemy), for reconnoitring, and for one's own buildings. As an instrument of knowledge, "the lively spirit and the grace," perfectly expressed in drawing, teach more than verbal description, written or oral. He says: "I dare affirm a man shall more profit, in one week, by figures and charts well and perfectly made, than he shall by the only reading or hearing the rules of that science for half a year." The two directions in which drawing specially was educationally used were: First, in the illustration of interpretations of the Ptolemaic cosmography and geometric figures; and, secondly, in the maps of the discoveries of Columbus and his successors. (See GEOGRAPHY, HISTORY OF THE TEACHING OF)

Richard Mulcaster (*q.v.*), in his *Elementarie* (1582), advocated the introduction of drawing into all primary education, both for "profit sake" and for "pleasure." Mulcaster wrote a letter (in Latin), 24th April, 1581, to Abraham Ortelius, the great geographer, asking him if he knew of any one, besides Dürer, who had written, with adequate knowledge, on the education of boys in elementary drawing, basing his views on the inner principles of geometry. The letter is interesting as showing, historically, the correlation of drawing and geography, and as illustrating Mulcaster's pains to try to include the best account of teaching methods in his *Elementarie*.

Drawing in Private Schools of the Seventeenth Century. The private schools were the first to introduce drawing. Thus, in 1582, Robert Ricorde undertook to teach pupils to "draw or reduce any map or card in true proportion." In 1607, another private schoolmaster, John Mellis, says that drawing had been a natural gift to him, and that he had taught it in his school for eighteen years. In 1572, Sir Humphry Gilbert had *proposed* to include the drawing of maps, sea-charts, and perspective in the projected Queen Elizabeth's Academy. Sir Francis Kynaston, in his proposed *Musaeum Minervae*, 1635, suggested the teaching of painting and sculpture; and the prospectus of Sir Balthazar Gerbier's Academy at Bethnal Green, in 1648, included drawing, painting, limning, and carving. Drawing was advocated as a subject of study, in 1622, by Henry Peacham, the younger, in his *Compleat Gentleman*; in 1641, by Hezekiah Woodward, in *A Light to Grammar*; in 1648 by Sir William Petty for the curriculum of his proposed *Ergastula literaria*; in 1649 by George Snell, in his *Right Teaching of Useful Knowledge*; in 1650, by John Dury in the *Reformed School*. Peacham, in 1622, says that many English nobles and gentlemen were skilful in drawing.

Dr. W. A. Shaw has shown that, in England, there was an Early English pro-Holbein school of portraiture, and that painting was held in high esteem is typified by the office of the king's "Serjeant Painters," an office existent, at any rate, from 1447 to 1679. Painting, however, as a fine art, to be studied by ladies and gentlemen, had to differentiate itself from the professional side; and was advocated by the writers of "gentlemen's"

books, only if done without any payment. In the seventeenth century, with the development of "realist" education, drawing became a subject of study by gentlemen with a "practical" tendency. Nathaniel Bacon, son of Sir Nicholas Bacon; John Aubrey; Samuel Foster of Coventry; Thomas Hobbes are cases in point: and of Sir Isaac Newton it is said that the walls of his room were covered with charcoal drawings of birds, beasts, men, and ships, as well as of mathematical figures.

Drawing in Public Schools. Nevertheless, the first public school to attempt to establish a department of drawing was Christ's Hospital as late as 1692, but the plan was a failure. In connection with the project, Sir Christopher Wren pointed out that designing or drawing is the basis of all mechanic arts, and asserted that its study was general in Italy, France, and the Low Countries.

In 1749, John Gwynn, an architect, a friend of Samuel Johnson, suggested the establishment of a national Academy of Art in his *Essay on Design*. The Royal Academy, with its schools of painting, sculpture, and architecture, was not established till 1768, when Sir Joshua Reynolds was selected as the first president.

It was not, however, till 1837 that drawing was officially recognized in England by the establishment of the School of Design at Somerset House. In 1852, the school was removed to Marlborough House, and in 1856 to South Kensington, the name being changed to the National Art Training School. In 1853 the Science and Art Department was established under the Board of Trade. This department established schools of art in provincial centres, which were maintained by Government grants. In 1856, this department came under the direction of the Committee of the Council on Education, and training colleges for teachers were examined in drawing for the first time. In 1857 it was agreed that teachers of elementary schools should receive £5 augmentation to their salaries if they had passed examinations in drawing and taught the subject successfully in their schools. In 1888, the Cross Commission recommended that drawing should be taught to all boys; and in the Code of 1902, drawing (including drawing from objects, memory or brush drawing, the use of ruler and compasses) was included as a subject of the ordinary curriculum of all elementary schools. F. W.

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DRAWING IN SCHOOLS AND COLLEGES, THE TEACHING OF.—What is the object of teaching drawing in schools?

To this question the *drawing teacher* should be able to give a definite answer. The aim being clear, the means of its attainment may be considered.

The answer should be—broadly speaking—threefold—

1. To develop the faculty of graphic representation; that is, not only to train the pupil to copy, but also to draw ideas he conceives, or things he remembers.

2. To establish a habit of consciously observing the actual appearance of things and also a habit of observing the appearance of things seen in the mind's eye.

3. To aid in the cultivation of an independent aesthetic judgment by exercising the invention and the imagination.

The Faculty of Graphic Representation. The more completely we have in the mind what we wish to do, the more easily will the hand respond.

It follows, therefore, that the more knowledge we possess of an object we wish to draw, the more likely are we to make a good drawing, however much or little our skill of hand may be. The way in which that knowledge is to be gained varies very much.

It used to be generally accepted that the way to gain a power of drawing was to copy accurately, to have the errors pointed out, and corrections made. The opinion of William Hogarth may be cited as evidence that that view was not always held: "I thought it . . . unlikely that by pursuing the common method and copying old drawings, I could ever attain to the power of making new designs, which was my first and greatest ambition. I, therefore, endeavoured to habituate myself to the exercise of a sort of technical memory; and by repeating in my own mind the parts of which objects were composed, I could by degrees combine and put them down with my pencil."

The direct copying method would probably be the best way to teach drawing, if the training of copyists were the sole object; but surely we should also aim at developing the power of expressing ideas, towards which the ability to imitate goes but a part of the way. The operations of the mind when copying an object are very different from those when endeavouring to draw an idea conceived or something remembered. In the one case, the object is fixed, and can be examined and copied in rather a mechanical way without much mental effort. But, in the other case, concentration, effort to recall, and very careful observation are necessary to catch hold of, and translate into graphic form, the image in the mind's eye. It should be remembered that the greater part of the drawing done during life, whether it be by an artist or by an average person, is "out of the head."

It has been said by critics of the memory method of teaching drawing, that there is no use in asking the pupil to draw things from memory until he knows something well enough to draw it. That would be true if the pupil knew nothing of anything that could be expressed by drawing; whereas the pupil knows a great deal about the appearance of many things, but he is not in the habit of clearing up in his mind what he does know about them.

The problem is how to get at and use this store of memories. There are two ways—broadly speaking—by which we bring to mind things we have seen. We may recollect them by words and vague images, or we may recall them by means of mental pictures. It is through the development of the latter means that we can bring into use most of our stored-up knowledge.

In order to do this, it is necessary to cultivate the habit of observing the details as well as the general

appearance of mental pictures. For instance, having brought to the mind's eye a general image of, say, a violin—any fairly well-known object would do—one can then focus a particular portion of it (the bridge, let us say); it will then be found that the details of structure will come into the mental vision.

There is nothing new or out of the way in this, for the mental processes involved are in common use amongst artists. Probably the greater number of artists and art workers are quite unconscious of the processes of thought; as *artists* they need not be otherwise; but the case is different with teachers—they, at least, should know something of them.

Of the two methods of teaching drawing (*i.e.* by direct copying or by drawing from memory), the latter is the likelier to cultivate faculties which enable the student to express ideas well; nor need the habit of drawing from memory hinder him from becoming a good copyist.

It should be clearly understood that a memory drawing of an object of which a sight drawing has already been made is a very different exercise from a memory drawing made of an object which has not previously been drawn from sight. The effort of the mind necessary to retain a vivid impression of an object is a much more educative exercise than the effort needed to copy from sight.

To learn a piece of poetry by heart, we first read it over to get the sense of it; we next read a line and look away from the book, repeating it from memory as well as we can, any failure being corrected by a glance at the book. So we take line after line until we can say a whole verse correctly. Just so may a memory drawing be made; look at the object to be drawn and consider it as carefully as possible, then shut the eyes and endeavour to recall it to the mind's eye. This effort should be persisted in, for, on closing the eyes, an image of the object may not at first appear, but by waiting a little and making further effort to recall it, it will probably come into the mental vision. If the image is imperfect, take another look and close the eyes again, and so on until the image is fairly clear. Then draw the object "out of the head." It is a good plan to draw the mental image while the eyes are shut. The result may be a mere jumble of lines, but if a persistent effort has been made to follow the outline of the mental image, it will be found that, on opening the eyes, the mind will have a very clear idea to work from.

The Habit of Conscious Observation. The observation of the appearance of an object necessary to drawing it is more searching than the observation of one who looks at an object without the intention of drawing it; the latter takes a general impression into his mind, but one who draws not only observes the general aspect but details also. He compares part with part, notices light and shade, perspective, and many other qualities which the ordinary intelligent observer is unconscious of seeing. Indeed, it may be said that to draw is to make the mind conscious of what the eye sees. "Teach sight," says Ruskin; "perhaps, on the whole, the most important thing to be taught in the whole range of teaching." Nevertheless, when the pupil gets into the habit of copying, he is apt to draw with little thought—almost automatic imitation—which is not good from an educational point of view. Drawing from memory will counteract this tendency, for then every stroke the pupil puts down he must think about—be conscious of. Not only does this method of drawing fix objects in the memory, but it also impels the

mind to seek in the memory likenesses to, and associations with, what it sees and desires to be able to recall. Besides, it aids in the development of the power of mental picturing which is necessary to the graphic expression of ideas conceived in the mind.

It will be found that special training to observe the mental picture is necessary in order to catch its suggestions. For we must not overlook the fact that the mind unconsciously contributes to the mental image; that is to say, more comes into the mental vision than is consciously evoked; and it is generally admitted that these involuntary contributions are often, if not always, the best and most individual ideas.

The Aesthetic Judgment. The appeal of a work of art is greater or less in proportion to the knowledge and susceptibility of the mind looking at it. In the words of Shelley, "all things exist as they are perceived, at least in relation to the percipient." Therefore it is desirable to give the pupil such knowledge and experience as will ensure an enlightened reception to ideas entering his mind. To gain this enlightened perception, he needs that special experience which is acquired through the effort to produce something beautiful, the exercise of creative imagination, and efforts to solve executive problems.

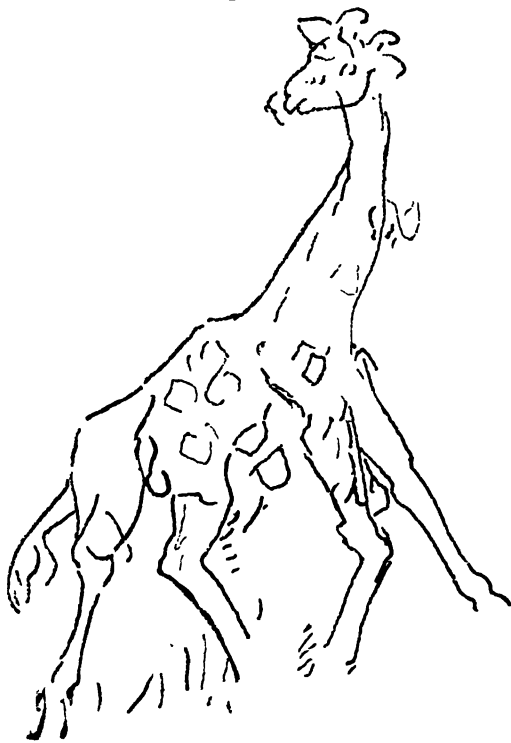


Drawn by a boy with his eyes shut, on being asked to visualize a horse in any position.

We are told that the young child's development of sight and muscle is not such as to permit of his making small drawings with advantage. However that may be, what has to be done with him is to encourage him to draw what he likes out of his head. The teacher's business is to stimulate effort rather than to instruct. Should the child appear to lack ideas, the teacher should endeavour to excite his fancy or memory so as to give him a start by suggesting things or incidents likely to interest him; such as a horse running, a dog barking at a cat, a gun firing, a man running, a boy playing, briefly

told stories, always suggesting some action or movement.

The vivid fancy of a child can be used as a means of education. By his constant effort to express his fancies, he gains power to focus them more accurately and as he grows older and more skilled in hand, he seeks more truth of representation.



Drawn by a boy with his eyes shut after a visit to a Picture House.

The teacher's difficulty is to supply him with such knowledge as will help him towards that more truthful representation without drowning his fancy in an accumulation of facts. He must not be put out of conceit with himself by being shown how much better than he the teacher can draw a horse or a dog, or what not. He should not be inoculated with a way of drawing a thing.

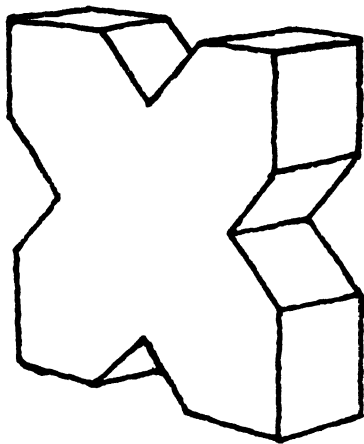
Let his pictures be free experiences—play, fun; always find good in them; be careful to discover what they really mean; do not find fault with the incorrect drawing of them or allow anyone else to do so. Do not make comparisons between children's drawings. To do so is to encourage the copying of the approved drawing, to discourage freedom of vision and expression, and to set up the teacher's opinion as the measure of success; that is not desirable, however good the opinion may be.

While these pictures are being drawn abundantly, exercise the pupil in observation by comparing one shape with another, one colour with another, one size with another—thus developing the habit of comparing things. For instance, compare a lemon with an egg; an apple with a pear; a potato with a turnip; a parrot with a pigeon; etc. It is not intended that these observations should at once be directly applied to the pupil's self-expression drawings, but

that they should be a means of supplying him with knowledge which will eventually find its way into them. He should record all the differences he perceives, the teacher gradually urging accuracy. These records should be drawn from memory, and not only at the time of observation, but also some time—even days or weeks—after.

Perspective and Light and Shade. Perspective should be very gradually brought to the notice of the child. Simple facts should be pointed out, such, for instance, as the way objects appear to decrease in size as they recede from the eye, and the change in shape due to foreshortening.

When the teacher draws a perspective aspect of an object, that object or some substitute for it, should, if possible, be at hand, so as to enable the child to realize the truth of what the teacher has drawn. To illustrate the perspective of a tunnel,



A dictated drawing.

a long tube or roll of paper might be used. If one end be held near the eye, the other end will appear comparatively small; but the child knows they are actually the same size. He should be encouraged and aided to express the illusion by drawing it.

Light and shade, too, has to be brought under the child's observation in very much the same way. It should be remembered that the beauty of light and shade and of perspective does not appeal to a child as it may to a trained adult, but their illusion-producing qualities do; and, as children like illusion, that is a direction in which the child can be excited to effort. To make something look round, hollow, or to stand out in relief gives great interest. Thought and experience will indicate the standard of executive skill to be expected from a child; it certainly cannot be that of the trained teacher. Increased knowledge of light and shade should be gained by careful study of simple objects, such as a sphere, a hollow half-sphere, shown to him under one light.

The teacher should ask the cause of every light and every shadow; and when the pupil fails to explain causes satisfactorily, the teacher should help him out judiciously. The objects thus examined should be drawn from memory. The teacher can gauge from his pupil's effort how much he has taken in, and can point out the weak parts after further talk in front of the object drawn; the pupil should make corrections, still from memory. A cube as

well as a sphere should be used, the one giving flat and the other round surfaces.

A great variety of exercises can be worked out by using these three objects, viz., sphere, hollow half-sphere, and cube. The exercises need not be limited to these three figures; a ruler or something of the sort can be laid against any one of them, casting on it and on the ground interesting shadows; a piece of rope can be tied round the sphere; little balls of Plasticine can be pressed on it, casting agreeable shadows and making pleasant shapes and patterns; the cube may be turned into a house, etc., etc. A sheet of looking-glass placed under or behind the object will be found to add interest and instruction, since it gives other perspective views of the object, and introduces reflection, which is a somewhat neglected subject in spite of its interest and charm and it might lead to the study of water.

Drawing Objects from Dictation. Describe an object; then the position of it—on a level with, below, or above the eye; then let the pupils draw it. Dictate in the following manner—

Think of a cross made of wood of square section, the four limbs being the same length; imagine it lying flat on the ground, in such a position that the ends of two of the limbs are equally near you.

Other simpler or more difficult exercises can be thought out by the teacher to suit the knowledge and experience of the pupil. Before giving such exercises, the teacher would do well to write down the problem as well as draw it before giving the lesson, for it will be found difficult to state many of these problems accurately and in such a manner as to produce a clear image in the pupil's mind.

Plans and elevations of objects should be shown to the pupil; from these he should draw, frehand, perspective aspects indicated by the teacher. Such exercises as these create interest and thought, and train the pupil to apply the knowledge he has already gained.

Light and shade should also be dictated; some such problem, for instance, as the following: Imagine a column or long cylinder standing on the ground near—but not touching—a wall on the right; the wall vanishing to the left at an angle of 60°; the light is from the left and coming a little towards you. Draw the shading on the column, and the shadow the column casts on the wall and ground. Then compare it with the actual thing.

Besides geometric objects, others—natural and artificial—should be used; casts of fruit, fish, shells, etc. Casts are suggested, as they do not complicate the light and shade by introducing colour.

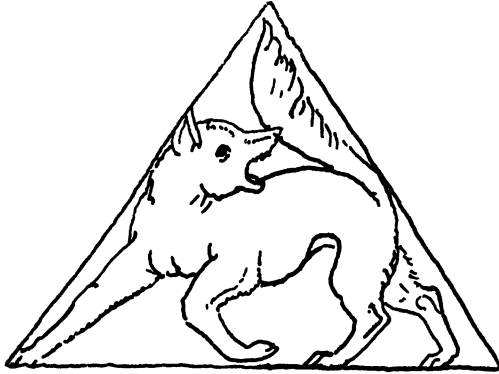
Drawings should often be made without using indiarubber; such exercises give decision. With the same object in view, pen and ink should occasionally be used instead of pencil.

Plant and Animal Drawing. Drawings from plant form should be made by first carefully observing the portion of the plant decided upon, so as to get its appearance and structure well into the pupil's mind; that is, supposing it to be a leaf, what shape is it compared with other leaves and geometrical forms? Then let it be drawn from memory, taking occasional looks at it to refresh the memory, not troubling at all about perspective, as the first aim should be the perception of typical shapes.

The specimen of plant form to be drawn should be selected for its perfection (*i.e.* not withered or broken, or fading).

Drawing from live animals, where possible, should be taken. This exercise should proceed as follows:

The animal should be looked at for some minutes, then the pupil should turn his back to it and draw it from memory. The teacher may urge the pupil to close his eyes and try to see it in his mind's eye. More likely than not it will be found that some action of the animal has impressed itself on his



An exercise in space filling.

mind; that action he should be encouraged to draw. When live animals are not possible, lantern slides of them make a good substitute, and well-selected photographs would also serve the purpose, though not so well as slides.

The details of structure of an animal should be observed carefully, and notes made from memory. It may be said that if the animal moves much, the drawing must be from memory; still, it is better not to be facing the animal while the drawing is being made.

Use of Lantern Slides, Photographs, and Media of Expression. A lantern slide may be shown for a very short time, say, a few seconds, or for a comparatively long time, five minutes: how long and how often must be left to the teacher's judgment. Experience shows, however, that one look of about five minutes is the best for general practice. If the slide is shown more than once, the pupil is apt to rely upon the next look, and does not make the concentrated effort necessary to the making of a drawing after one look, which is such excellent training.

In speaking about the slides, the teacher should remember that the structural aspect of the object shown should not be dwelt upon so much that the pupil loses sight of the less palpable qualities in which beauty chiefly abides. Slides should include leaves, fish, birds, and pieces of ornament. Here, again, good photographs may be substituted for the slide.

The slide may be used in many ways: one of its uses, tending towards the development of invention, is to show a part of an object or pattern to the pupil and ask him to imagine and draw the rest of it. Again, a simple unit may be shown and the pupil asked to picture it in his mind's eye, adding others to it so as to form an agreeable combination. These combinations of units should first be drawn with the eyes shut, and afterwards with the eyes open; the latter should be accurately drawn.

Colour Work. Coloured chalk is no doubt the most convenient material for the young child; but as soon as possible, water-colour should be substituted, for two reasons—

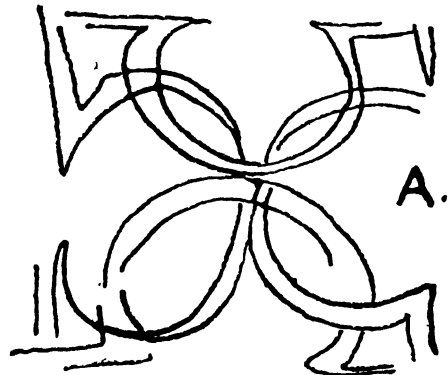
In the first place, chalk in the hand of a child—

whatever it may be in the experienced hand—is not a good means of expressing truth of colour, for the colour of chalk cannot be easily modified, and so the child is obliged to use what he has and let it stand for what he sees. That tends to throw him off observation, and results in an acceptance of untrue representation. In the second place, chalk is not suitable for use in later life.

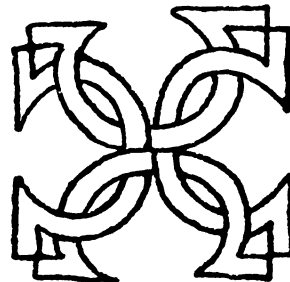
Colouring should be taught on memory lines in much the same way as pencil drawing (*i.e.* by highly conscious observation and the exercise of the faculty of mental imaging).

To aid the memory in recalling the colour of an object, it is well to seek some likeness between its colour and that of something else known to the pupil. For instance, if something of a blue colour is being considered, which of the blue things known to the pupil is its blue like? His power of recall will in this way be aided by association. (Da Vinci recommended the student to keep in his note-book drawings of a series of noses to aid him in remembering faces he saw in the street.)

The same method of observation and inquiry should be applied to texture. For instance, is the object a little shiny, like the surface of an apple, or is it very shiny like glass? Is it opaque or transparent? Why does it look transparent, or why



An arrangement of a given unit; drawn with the eyes shut.



Drawn with the eyes open after A had been drawn.

opaque? What is it makes the differences of material visible? Thus by inquiry and observation the pupil is roused to a high state of consciousness of the look of what he sees.

Dexterity with the brush—broad, skilful artist's handling—should not be aimed at: that will come in due time.

Photographs of pictures, sculpture, and handicraft should be shown to the pupil, little or no comment being made upon them, save such facts as their historic period, the use for which they were intended, and the way they have been produced. The restriction here suggested is necessary, as so much misunderstanding can come from comments of an aesthetic nature on works of art. The pupil might make memory drawings from them, sometimes taking a part or detail instead of the whole picture or object.

Museums give an excellent opportunity for this kind of study.

It is a good and interesting exercise for the teacher to describe a picture carefully, and to allow the pupil to draw the impression received. If possible, the picture described should be unknown to the pupil.

The Human Figure. This should be included in the subjects chosen for free-expression exercises. It is, however, such a difficult subject to deal with adequately in an ordinary school or college, both on account of the short time generally devoted to drawing, and to the lack of the necessary equipment, that nothing more need be said about it than that the general quickening of observation and invention given by the course here outlined, along with occasional exercises in sketching from people—both moving and fixed—will help the pupil to express ideas which include human figures. To go further in the study of the subject, it must be taken in a first-rate art school. R. C.-S.

DRAWING SOCIETY, THE ROYAL.—This Society was founded by T. R. Ablett, Esq., F.R.G.S., "for the encouragement of the natural development of drawing as an integral part of General Education." The title "Royal" was assumed by command of Queen Victoria in 1892, and confirmed in 1901 by King Edward VII and in 1910 by King George V. King Edward VII was the first patron of the Society, and for many years the Princess Louise, Duchess of Argyll, has been president.

The Society exists for the development of the child's natural love of picture making. As a means of making drawing "an integral part of general education," the Society encourages this natural development, and fosters the child's instinctive delight in the structure and working of natural objects, and of things made by man. As defined by the Society, drawing is "the process of producing by human effort certain markings of a descriptive nature to serve as records and convey information in connection with pictorial, mathematical, diagrammatic, and decorative work"; and the Society aims at encouraging continuously a child's early delight in picture-making throughout its home-life and its school-life as a basis of education.

For the use of schools, syllabuses have been drawn up for Pictorial Drawing (I, II, III) and for Mathematical Drawing (IV); and by the co-ordination of these syllabuses, "world-visualization, or thinking in shapes," is to be developed as a means of uniting all branches of knowledge.

Snap-shot Drawing. The Society attaches great importance to snap-shot drawing, which it defines as "the exercise of memory and imagination, separately or together, in connection with definite pictorial impressions obtained under prescribed conditions of original observation by means of sight or any other sense." In snap-shot drawing, all memory of drawings is excluded, and the pictorial

impressions are reproduced as derived directly from Nature and as seen by the observer. Observation is stimulated at first and mainly by the sight, but other senses may be employed in order to create definite pictorial impressions. Single definite pictorial impressions are obtained by one observation lasting not longer than one minute: first, the object is seen, and reproduced as observed; secondly, it is partly seen and partly suggested by other senses; thirdly, it is entirely unseen, and merely suggested. In each of these stages the object may be stationary, or first moving and then stationary, or continuously moving. A more advanced stage of snap-shot drawing includes the observation of the different characteristics of one object, or the observation of the component parts of a group.

Syllabuses of the Society. Each of the four syllabuses above mentioned provides a year's work in each of its several divisions, and the Society holds examinations and awards prizes for work done in each syllabus.

I. PICTORIAL. This syllabus includes six divisions, each based on an "essential" subject with "snap-shot" drawing tests, thus—

1. Description of surfaces and the resultant silhouette.
2. Elementary perspective; simple fore-shortening.
3. Perspective of simple straight-lined objects.
4. Perspective of straight-lined objects. Fore-shortened surfaces.
5. Effect of light falling on an object.
6. Water-colour or pastel painting from a group of coloured objects. Head and figure drawing. Decorative and pictorial composition.

II. PICTORIAL. A suggestive syllabus is given as a guide to the selection of suitable objects for study to be drawn with pencil, coloured materials, or brush. In the Snap-shot Drawing Syllabus, stress is laid on the important matters to which observation should be directed in the study of human nature, such as attitude, proportion, structure, and surface description.

III. PICTORIAL. This syllabus provides a series of steps from the standard of the full school certificate to that of the teacher-artist certificate, the essential feature being illustration. For the Society's examinations, candidates must furnish evidence of their interest and range of observation by submitting to the examiners a diary of snap-shot drawings, consisting of twelve sheets, each at least 14 in. by 10½ in. These drawings should include human nature study and outdoor observations, and should be suggestive of the environment of the student. There are six divisions in this syllabus, and the time of examination ranges from 2½ to 4½ hours, and the sizes of figures from 6 to 16 in.

IV. MATHEMATICAL DRAWING. This syllabus is divided into six sections, each in three parts: Geometrical drawing, projective drawing, and sketching as an aid to visualization.

The entrance fee for school or studio, which covers any number of pupils, is £1 ls. for the year, the school examinations being usually held in February, June, and October. An extra charge of half-a-crown is charged for each candidate if professional criticism is required.

Exhibitions and Teachers' Examinations. The Society's annual exhibition affords opportunities to boys and girls of conspicuous ability to execute work which cannot be done under examination conditions. Awards of gold, silver, and bronze stars and marks of commendation are made to

competitors (1) under 13 years of age, (2) under 20 years, (3) over 20 years; and works of merit may be purchased by the Society for permanent exhibition in the Society's gallery.

An exhibition of teachers' work is held in connection with the Society's annual meeting, and four gold stars are offered for the best work in each of the sections: (1) Figure; (2) landscape or still life; (3) black-and-white drawing; (4) sheet of six drawings done spontaneously without any help, by children under 7 years of age.

Teachers competing in section (4) must write against each drawing which they collect a line or two concerning the cause and motive of production. Teachers who are specially active in the discovery and encouragement of this "Art of Childhood" are eligible for election as Members or Associates of the Royal Drawing Society.

The Society examines teachers for the purpose of granting teacher-artist certificates. The examination includes three subjects: Subject I includes five papers of 2½ hours each in actual drawing—object drawing or model, shading from coloured objects, snap-shot portrait, figure from life and painting in water-colour or pastel; Subject II, the theory of teaching drawing; Subject III, the actual teaching of a class by collective methods. Lectures are given in sport and extended courses arranged to prepare teachers for the second and third subjects of the Teacher-Artist Examination.

The offices of the Society are at 50 Queen Anne's Gate, Westminster, S.W.1.

DREAM ANALYSIS.—There are three ways of investigating dreams: they are, chronologically stated, (1) the antique, and still popular, method of arbitrarily interpreting them according to intuition; (2) the method of experimental psychology, in which connections are established between them and physical or mental stimuli, more often the former; (3) the method of unravelling them by applying the technique of psycho-analysis, invented by Freud. (See *PSYCHOTHERAPY*.) It is in the last sense that the term Dream Analysis is here used. The conclusions reached by the use of the second method differ from the beliefs accompanying the use of the first in denying that dreams have any mental meaning, and in demonstrating that they are the products of preceding causes. The conclusions reached by the use of the third method, while fully agreeing with the latter point, accord a certain validity to popular belief in so far as this holds that dreams do have a definite mental meaning, though not, of course, a supernatural or prophetic one.

The chief steps in the technique of the psycho-analysis of dreams are as follows: The dream is divided into its constituent parts. The dreamer concentrates his attention on each part in turn and relates *all* the thoughts that enter his mind when so engaged. If the casual, disconnected, and apparently irrelevant aside thoughts are followed up, it will be found that their associations regularly lead to personal thoughts of considerable significance. The material in this way collected contains certain nodal ideas that recur again and again, which are plainly related to the dream itself. They are called the *latent dream*, in contradistinction to the *manifest dream*, or the unanalysed content of the dream as remembered. There is every reason to think that the manifest dream has proceeded from the latent "dream thoughts," so that the work of analysis

is the counterpart of the synthetic process of dream-making. In other words, the manifest dream is the substitute for the latent dream. The questions thus arise: How are the latent dream-thoughts converted into the manifest dream, and what function, if any, does this conversion subserve?

Dream Mechanisms. A comparative study of the two sets shows that the translation of one into the other proceeds by quite definite psychological laws, which can be formulated under the heading of four distinct mechanisms. The first of these is called *Condensation*, by which term is indicated the fact that every element of the manifest dream represents several "dream-thoughts" from the latent content, it being thus "over-determined." For instance, a figure in a dream may be constituted by the fusion of traits belonging to more than one person; this may occur either by the fusion of some traits belonging to one person with others belonging to another, or by making prominent the traits common to the two and neglecting those not common (the latter process producing a result analogous to a Galton composite photograph). It is by means of this mechanism that similarity, agreement, or identity (real or wished for) between two elements in the latent content is expressed in the dream: the two simply fuse and form a new unity.

The second distorting mechanism is called *Displacement*. In most dreams it is found after analysis that there is no correspondence between the psychical importance of a given element in the manifest content and that of the associated ones in the latent content. The most prominent emotion in the dream often accompanies elements that represent the least important of the "dream-thoughts," and conversely. A transposition of feeling or psychical intensity has taken place whereby a highly significant idea has become replaced by a previously indifferent and unimportant one (often a casual and hardly noticed impression of the preceding day, as such impressions from the paucity of their associations lend themselves well to this purpose).

The third mechanism may be called *Dramatization*. Most dreams resemble a theatrical performance, and the mode of representation employed, like all arts, is subject to definite limitations, so that special expedients have to be used to indicate mental processes which cannot be directly portrayed. It is well known, for instance, that most dreams are predominantly visual in character. (This process of expressing in a dream various underlying thoughts in the form of visual pictures Freud terms *Regression*, wishing to indicate by this the retrograde movement of abstract mental processes towards their primary perceptions; the network of dream-thoughts is thus resolved into its raw material.) Under this heading are also included various devices for the presentation of the logical and grammatical relations between the different "dream-thoughts," relations which find no direct presentation in the manifest content of the dream.

The last of the dream mechanisms, termed *Secondary Elaboration*, differs from the other three in that it arises from the activity of the more conscious mental processes. The process often does not go far, but to it is due whatever degree of ordering, sequence, and consistency there may be found in a dream.

The dream work does absolutely nothing but translate into a usually unintelligible series of hieroglyphs a group of already formed "dream-thoughts." It performs no creative work whatever

and no act of thought (judgment, decision, etc.); these, when present, have been taken bodily from the "dream-thoughts" and do not belong to the dream making. It proceeds by methods quite foreign to our waking life, ignoring obvious contradictions, making use of strained analogies, etc., in just the same way as an insane patient does. There is much to say about the *sources* of the material used in the dream-making (as distinct from the "dream-thoughts"). In every dream there occurs one or more mental processes that have been experienced by the subject in his last waking interval. Hypermnnesia (remarkable memory) for experiences of early childhood, often long forgotten, is a striking feature, and is still more often present in regard to the underlying "dream-thoughts." Sometimes dream material is taken from physical stimuli during sleep, though by no means so often as is generally said. They never afford the explanation of the dream itself, but are merely material used for its structure in the same way as other psychical material.

Significance and Function of Dreams. There next arises the question of the significance and function of the dream, and the nature of the forces that have brought it about. The essence of Freud's theory is his tracing the distortion considered above to the presence of various "repressing" inhibitions that interpose an obstacle to the becoming conscious of certain mental processes; these inhibitions he groups under the name of "censorship." He finds that the "dream-thoughts" of the latent content are always of such a kind as to be unacceptable to consciousness—on aesthetic, social, moral, or similar grounds. The individual is not aware of their existence, because something in him does not want to be; they must, therefore, remain "unconscious." The dream is a distorted and unrecognizable presentation of such thoughts. In sleep, the activity of the censorship is diminished, though never entirely abrogated, and the manifest dream is a compromise between it and the forward urge of the repressed "dream-thoughts." The censorship can be evaded in other ways than through the mechanisms of distortion considered above. For instance, the ideas may remain unchanged, but their meaning is concealed by the feeling being reversed. The forgetting of dreams, which is even commoner than is generally appreciated, is another effect of the censorship; for this reason, the analysis of previously forgotten fragments is specially important, for they always relate to the most repressed of the dream-thoughts.

Dreams never proceed from trifles, but only from thoughts that are of the greatest moment and interest to the subject. Further, the "dream-thoughts" are invariably egocentric. The dreams of very young children are usually logical and consistent, and it is then easy to recognize that they represent the imaginary fulfilment of an ungratified wish; something denied the child by day happens satisfactorily to him by night. Freud maintains that the *latent content* of all dreams, without exception, represents nothing else than the imaginary fulfilment of an ungratified wish, usually in the case of the adult a repressed and unconscious wish. It is probable that behind the manifest content of a dream there always lies an infantile wish. It goes without saying, that among repressed wishes, sexual ones of various kinds play the most prominent part, though not an invariable one. A dream thus represents the imaginary fulfilment of a repressed infantile wish, which has been recently stirred into

activity, but which is not allowed to enter consciousness except in a guise that conceals its true meaning.

In conclusion, the *function* of dreams appears to be simply this, to protect sleep by satisfying and stilling the activity of aroused unconscious mental processes that might otherwise disturb it. Maeder, followed in this country by Nicoll, sees other functions in dreams, such as the tentative probing of various solutions of disturbing problems; but this view is certainly based on a confusion on their part between the dream proper and the latent content that underlies it, being often true of the latter. Dreams are the guardian of sleep, and the frequent expression "sleep disturbed by dreams" only means sleep disturbed by unconscious mental activity which the dream-making faculty is endeavouring, often unsuccessfully, to assuage. In the case of a bad dream, from which the subject awakes, the activity of the censorship, which is diminished during sleep, is insufficient to keep from consciousness the unacceptable dream-thoughts, or to compel such distortion of them as would render them unrecognizable, and recourse has then to be had to the accession of energy that the censorship is capable of exerting in the waking state; metaphorically expressed, the watchman guarding the sleeping household has been overpowered by thieves, and so has to wake it in calling for help.

ERNEST JONES.

DREAMS.—Modern psychology has recently begun to attribute to dreams an importance approaching that which they have always possessed for the untutored and the savage mind, but which, owing to their apparent senselessness, they have often been denied by the more educated. The actual material of dreams has been shown to have its origin in stimuli from within and from without the body, and from memories of past experience. But much further explanation is needed as to what principles govern the selection and interpretation of these stimuli and memories—principles which obviously differ in important respects from those operative in waking life. By far the most serious and successful attempt at such explanation is that made by the "psycho-analytic" school of Professor Freud, which sees in dreams the (usually) distorted expression of a repressed wish, which, owing to its nature being repugnant to the personality as a whole, is refused admission to consciousness during waking life, and is only permitted to enter in a distorted form during the relaxation of repression in sleep. This distortion is produced with the aid of symbolism and other mechanisms, the detailed study of which occupies a very large part of the present scientific literature on dreams. The great importance of dreams, as revealed by this study, lies in the fact that they provide the most convenient material for the investigation of the nature and working of the unconscious mind.

J. C. F.

Reference—

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DRESSMAKING, THE TEACHING OF.—The successful teaching of dressmaking demands very considerable ability from those embarking upon it as a career. The "ideal" teacher is a cultured woman of sound general education, besides being specially qualified in her particular subject. This is rightly becoming increasingly important. However efficient as a practical dressmaker, she requires to

study very definitely and thoroughly the various methods in vogue of imparting information, of class-management, and of demonstration. When teaching, she should always be able to guide her procedure in the light of some knowledge, at least, of the working of her pupils' minds, and be able to make her instruction appropriate to their individual and collective needs, and to their mental and manual ability. She should have had some training in the "artistic" branches of her subject; be able to draw and to design, both as regards style (with all the attendant consideration of form, proportion, and line) and also with reference to decorative work, involving a knowledge of effectively blending and managing colours. She will be thoroughly versed in all constructive work included under "practical" dressmaking; hence some *trade* experience seems highly desirable, however complete the general and particular training may have been otherwise. In the training school, and for qualifying examinations, but few dresses, blouses, skirts, etc., are required to be made *as types*. However well executed, they cannot include the great variety of style, cut, trimming, detail of finish, etc., likely to occur in rapid succession in any trade work-room. Nor can speed in execution be developed to any great extent outside a workroom, as it necessarily is under commercial conditions. To be attached to a dressmaking business in any one capacity is far from the ideal way of preparing for teaching (*e.g.* a sleeve-hand may claim trade experience, and yet prove incompetent to cut or fit a skirt and mount it at the waist). Nothing in practical dressmaking should be beyond the powers, or outside the experience, of an ideal teacher; hence, while connected with the trade, she should gain experience in choosing and designing styles for women of all types of figure and colouring. She should match and buy fabrics, trimmings, and haberdashery extensively; measure and fit adults and children for any and every style of garment; and have cut, tacked-up, fitted, corrected, finished, and pressed many blouses, skirts, dresses, and costumes before she is absolutely and ideally competent to conduct a dressmaking class. She must possess much initiative, inventiveness, and open-mindedness upon the merits of methods new to her. Finally, she should possess strength of character, combined with much sympathy, patience, good temper, charm of manner, and a force of personality.

Difficulties in Teaching. The teaching of dressmaking presents so many difficulties, that it is arduous even for the ideal teacher. Among them, for instance, are those arising from inadequate classroom accommodation and equipment. Sufficient table space to enable all pupils to cut out garments simultaneously seldom exists, and frequently the number of machines available is not enough to prevent students having to wait.

Conveniently placed heating apparatus for pressing irons is not always arranged for, nor are iron-stands and holders, skirt and sleeve boards, rollers, pads, and cloths for pressing invariably supplied.

Hanging-cupboards and drawers to accommodate the work of all class students, as need arises, are infrequently met with. Sometimes no dress-stands are provided, and rarely is there a wall or swing mirror large enough for a student to see the full length of her figure when being fitted.

Large blackboards and easels, dusters, and plenty of white and coloured chalks are essential. Unless a special table is used when tracing-wheels are

employed for marking round patterns, boards or pads are needed to prevent damage to classroom furniture. The artificial lighting of the room, moreover, is not always satisfactory for needlework, although, possibly, suitable for other subjects. The provision of opportunity for washing before or during lesson-periods is most important, and teachers should see that clean, dry towels are regularly supplied. Frequently it is absolutely essential for a dressmaking teacher to make emphatic requests for reasonable improvement in necessary equipment. She should not hesitate to place the matter before her committee, since success depends very largely upon suitable accommodation and tools being provided. If the teacher has been appointed as competent to conduct classes, she should not be expected to do so in unsuitable rooms unequipped with essential apparatus. Nevertheless, she cannot expect a committee composed of men, or, possibly, of men and women, who obviously are not specialists in dressmaking, to know, as a matter of course, exactly what is, and what is not, required for the successful conduct of special classes; and therefore the teacher should make her needs known.

Unnecessary or extravagant expenditure of public money is strongly to be deprecated, but the provision of the ordinary tools for a manual art is incumbent on all committees who undertake to have such classes held under their authority. Certain smaller tools (*e.g.* thimbles, scissors, inch-tapes, pins, needles, rulers, pencils, tracing-wheels, etc.) should be provided by the students.

The serious difficulty of over-large classes has to be combated at times, when it is well to reduce the question to one of calculation; in which case the impossibility of a teacher, however able, managing more than a certain number of pupils becomes convincingly apparent. For instance, the first ten minutes of a two hour lesson-period may be considered as devoted to registration, and to getting all pupils settled with their work and tools. At least twenty minutes, on an average, can profitably be spent in class demonstration, though frequently thirty to forty may be necessary, or ten minutes may suffice. The last ten minutes are wisely left for final instructions, packing-up, and dismissal. Out of the 120 minutes in a lesson-period, 40 have been accounted for, leaving 80 unallocated. Each student requires at least five minutes individual attention and supervision, and this is seldom sufficient should previous home-work have to be examined and criticized, and further tasks planned and discussed, enabling the pupil to go on at home in readiness for the next meeting. But should a pupil, or pupils, require fitting in addition, the allowance of five minutes per student will be quite inadequate. However, accepting it as a minimum, and dividing the available eighty minutes by the five, a total of sixteen pupils is arrived at. To leave no margin whatever for the unexpected is obviously unwise, so a class of fifteen should be considered the largest possible for one teacher if the requisite simultaneous instruction and individual attention is to be given.

Should the class have to be worked in two sections, as is frequently necessary and advisable for various reasons, two separate demonstrations may be required, and the teacher evidently cannot do justice to more than twelve students at the most. Such calculations should be considered merely typical, and are simply intended to uphold the

contention that many teachers are expected to cope with too large a class at once.

The Heterogeneous Class. Another very serious but frequent class difficulty is caused by the great differences existing between the various pupils. Not infrequently ages may range from 14 to 50 years, in which case it is clear that the same tuition can hardly be appropriate, nor can the same style of garment be chosen if pupils are making for their own wear. Then, again, the motives with which students join a dressmaking class differ greatly. Occasionally, unwilling pupils come, simply because they are sent either by parents or employers. Some desire simple instruction in "home" dressmaking, for family use; while others are employed in the trade already in some capacity, and hope by attending classes to improve their chances of promotion in business. Others, to whom sewing is a hobby, may attend a dressmaking class under an efficient teacher as a form of recreation, and it often becomes her duty to prepare students for various desired examinations.

Occasionally people of quite different social status and position are found together in a class; this tends to complicate matters somewhat. The amount of money which can wisely be expended out of her pocket-money on materials in a session by a girl of sixteen, by a general servant, a post-office clerk, a housewife, and a single woman of independent means, for example, varies considerably. Both the style and number of garments constructed, therefore, and the teaching involved must be arranged for accordingly. To construct a syllabus to suit the requirements and meet the needs of a collection of pupils of such varied types is not easy, yet this frequently falls to a teacher at the very beginning of her career. Hence the imperative need for her to have studied questions underlying class-management before she ventures to begin to teach, however capable as a dressmaker she may be.

Methods and Management. It is very evident, from a consideration of all the points raised thus far, that one duty of a teacher of this subject is to economize class-time, and so arrange that the maximum of definite, clear instruction, suited to the needs and capabilities of all concerned may be given in the minimum of time consistent with thoroughness. The chief means adopted to that end are class-demonstrations, given to all the pupils at once, or group-demonstrations to a section of the class occupied on the same type of work. As an example of class-demonstration, turning up the bottom of a skirt might be considered. Every pupil making either a skirt or a dress will require explanation before she carries out the process in whichever way best suits her particular material and style. To explain to each of fifteen students separately all the details involved in the one method suited to her needs means the teacher's expenditure of fifteen portions of time, and the pupil's mastery of only one way of turning up the skirt-bottom. If, instead, the teacher demonstrates one method to all the class at once, she saves fourteen portions of time (which she can devote to the most backward pupils individually) and also a corresponding amount of energy. Should it be necessary for more than one method to be demonstrated, she saves less time; but the pupils benefit by having learned the details of one or more methods besides the one needed for immediate use—a distinct advantage. As an instance of group-demonstration, take the teaching of machining.

It may be that only half the class can thread up and use a machine properly; while few, if any, are perfectly familiar with the accessories, or can set new needles, or clean the machine. The teacher, having arranged that one section of the class can go on temporarily working unaided for the time being, can devote her time to a group-demonstration of details concerning machining, which needs much more careful teaching than it sometimes receives.

When giving either class or group demonstrations, teaching apparatus of large size becomes a necessity. Life-size illustrations suffice if individual tuition is given; but, when describing and working the various stages of more or less complicated processes, something visible to all—including pupils seated at a distance—becomes absolutely essential.

Giant representations of such fastenings as hooks, eyes, bars, and press-studs, for instance, may be constructed by an ingenious teacher. It is highly desirable that members of a class shall be taught how to sew on a hook, for instance, so that it remains firmly on the garment until the latter is worn out, instead of coming off after a few weeks' wear. For demonstrating the method adopted, an ordinary hook ($\frac{3}{4}$ in. long) will serve little purpose; because what the teacher is doing is obviously invisible to the class. If she uses a home-made "giant" hook, constructed of stout, satin-covered millinery wire, quite 5 in. long—hence about twelve times the natural size—she can drive home all her points convincingly and easily. On the other hand, it is clearly not always possible or advisable to magnify size to this extent. The placket of a skirt, for example, would be over three yards long if made twelve times life-size, and, therefore, would be both absurd and useless. In this case apparatus not more than one and a half times natural size is as large as can be handled to advantage; but the desired effectiveness can be obtained, not by size, but by the careful choice of bright contrasting colours, so that one portion of the work may be made to show up quite sharply and distinctly against another, thus avoiding any possible confusion in the minds of pupils. Obviously, when tacking and sewing processes need to be demonstrated in front of a class, thick, bright-coloured threads or wools must take the place of ordinary sewing-cotton, which would be invisible at a distance. As a consequence, needles having large enough eyes to carry these threads must be employed, with the added advantage that they can be seen at a distance. Pins with black or coloured heads, instead of the ordinary short white, steel or brass pins, are similarly invaluable. The teacher of an inventive turn of mind is usually most successful in the construction of "telling" teaching apparatus.

Diagram Drawing. Another invaluable form of illustration is blackboard diagram-drawing, skill in which is rapidly being increasingly demanded from teachers of the many branches of needlecraft. It is an inexpensive and rapid means of making points clear, and both enlargement of size and contrast of colour can be utilized as occasion serves to render sketches distinct and plain, so that they may be the more easily remembered, or even reproduced in note-books by pupils desirous of keeping records of work done. As an aid in the teaching of drafting, too, the blackboard is quite invaluable; as all are sketches prepared on brown paper.

It is impossible in an article of this kind to do more than refer briefly to the place filled: (i) by finished specimens of sections of garments or whole

garments, full size or miniature, as illustrations; (ii) by leno and paper models; and (iii) by wall apparatus of various types. In fact, the question of illustrating lessons in dressmaking is practically inexhaustible, since the onward movement of fashion demands the constant addition of new forms and varieties, if teachers keep up to date. Besides teaching the standard foundations of the art, they must invariably prove themselves capable of dealing with "the latest fashion," ere it becomes superseded. Only by constant watchfulness of styles in wear—displayed in shops and illustrated in fashion books—can teachers hope to keep abreast of the times; since, as all practical workers know full well, "dressmaking is never learned," because of the constant striving for *change* in fashions.

E. R. H.

DRILL, MILITARY.—According to the *Manual of Infantry Training* (1914) issued by the War Office—

1. "Military drill is a means of moving troops from point to point in an orderly manner and in any desired formation.

2. "It is also a means of education in discipline.

3. "It is an important factor in giving troops the power of cohesion, and training them to give the absolute and instant obedience to the orders of a superior which is essential for success in battle."

Military drill may be roughly divided into Close Order Drill and Extended Order Drill.

1. **Close Order Drill** includes the following:—

(a) **SQUAD DRILL.** A squad of recruits should consist of from eight to ten men. Here they learn what is meant by discipline (in the military sense). Turnings, saluting, and some elementary marching are carried out in single rank. Diagonal march, changing direction, marching in file, and formation of "fours" are done in two ranks. Certain movements or exercises with rifles are taught to men while in squad—such movements as are necessary to prevent confusion in the ranks when rifles are moved, either to ease the marching soldier or for purposes of ceremonial.

(b) **PLATOON DRILL.** A platoon is made up of four sections each of twelve men, with the necessary officers and non-commissioned officers. Platoon drill has for its object the easy and quick movement of the four sections, so that different formations may be reached, according to the exigencies of the situation. These formations are: Line, column of fours or file, line of sections in fours or file.

(c) **COMPANY DRILL.** A company consists of four platoons all under the orders of the company commander. The object of company drill is "to train the four platoons to work together as parts of the same tactical unit, and to acquire flexibility and the power of rapid manoeuvre within the company." A company may assume the following formations: Line, close column of platoons, column of platoons, column of fours or file, line of platoons or sections in fours or file; and company drill embodies the methods of changing from one to another of these formations.

(d) **BATTALION DRILL.** A battalion consists of four companies under the command of the battalion commander. Battalion drill is merely company drill on a larger scale, with those modifications attendant on the increase of size.

2. **Extended Order Drill.** This follows on close order drill, and requires greater independence of action on the part of the soldier. It is the method

used in an attack when within range of the enemy's fire. It is intended to be the prelude to a bayonet charge. Extended order drill is generally carried out by signs or whistles, or by verbal messages passed from man to man.

The "drill" described in the above paragraphs is that of an infantry soldier, but it is only part of his military training. To it must be added musketry training, trench digging, etc., and specialist work such as signalling and scouting. In different sections of the Army (*e.g.* transport, cavalry, machine gun corps) the "drill" is varied to suit the work and constitution of the unit.

The objects of military drill, as stated above, are totally different from the objects of a sound physical education; and, if it is only a small part of a soldier's training, *qua* soldier, it should be a much smaller part of a boy's training, if taken at all. Where a corps is attached to a school, the drill must not be allowed to represent any large part of the boys' physical education. From an educationist's point of view, scientific physical education is much richer than military drill in opportunities for corrective training, training in agility, and the individual development of motor co-ordinations, and also for those moral and educational virtues which are such a special characteristic of our English games. Physical education must always be the basis upon which military training is built. The latter can never be substituted for the former without heavy loss.

H. M. C.

Reference—

Manual of Infantry Training (1914), issued by the War Office. (For Musketry, etc., see also the special manuals of the War Office.)

DRUGGIST, THE EDUCATION OF A.—(See PHARMACEUTICAL PREPARATION AND PROSPECTS)

DRUIDS, SCHOOLS OF.—Our knowledge of the Druids is derived chiefly from Julius Caesar (*De Bello Gallico*, VI), who wrote that, in addition to performing religious ceremonies, the Druids expounded matters of religion, and gathered many youths round them for the sake of education. Some came of their own choice, others were sent by their parents, and learnt in "the school" a great number of verses, while some remained there twenty years. The Druids considered it an unhallowed thing to commit their lore to writing, and they instructed their pupils orally in theology, astronomy, and geography, and specially inculcated a love of bravery and a contempt for death.

DUBLIN, UNIVERSITY COLLEGE.—Being unable to obtain fellowships and scholarships in Trinity College, Dublin, the Roman Catholics opened, in 1854, the Catholic College of Dublin, with Doctor, afterwards Cardinal, Newman as its first Rector. The Government would not grant a charter, so that no degrees could be awarded, and the college had to depend on private support and therefore to restrict its activities. In 1879, when the Royal University of Ireland replaced Queen's University, the Catholic College was able to appoint on the staff fellows paid by the Royal University and to offer students (except medical) for degrees. It was then reorganized and known as University College, Dublin, and became part of the Catholic University. In 1908, when the Royal University was dissolved, it became a constituent college of the new National University.

This, being undenominational and free from tests in awarding honours and appointments, commands the confidence of the Roman Catholics. The University College has five faculties: law, theology, medicine, philosophy and letters, and science. (See also IRELAND, NATIONAL UNIVERSITY OF.)

DUBOIS, PIERRE (born between 1250 and 1260, and died probably about 1321).—A mediaeval lawyer-politician of the widest outlook. His importance in the history of mediaeval thought may be gauged by the modern ideas to be found in his chief work, the *de Recuperatione Terre Sancte*, a treatise on politics. The account here given is taken from the Introduction to the text of Dubois' work, edited by C. V. Langlois (*Collection de Textes pour servir à l'étude et à l'enseignement de l'Histoire*; Paris: Alphonse Picard, 1891).

Dubois advocated (c. 1305–1307), six hundred years ago, the suppression of the temporal power of the Popes, the confiscation of the property of churches and monasteries (over two hundred years before Henry VIII's drastic action) for national purposes, international arbitration as a means of securing perpetual peace, and the federation of the European nations under the suzerainty of France. He declared himself against the celibacy of the clergy; he suggested military reforms, advocated emigration and colonization of distant countries (more than three centuries before the Pilgrim Fathers set sail for New England), and called for the codification and simplification of the laws.

As M. Langlois says of Dubois' famous contemporary: "Roger Bacon himself had not that appetite of reform, that fierce love of progress, that width of horizon."

Dr. R. L. Poole, in his *Illustrations of the History of Mediaeval Thought* (p. 257), states that Dubois suggested that it would be best for all countries if the whole world were brought under French rule. "For it is a peculiar merit of the French to have a surer judgment than other nations, not to act without consideration, nor to place themselves in opposition to right reason."

This view, however, was expressed in Dubois' book, *de Abbreviatione*. In the later *de Recuperatione*, the view is rather that of a federation of the nations, under the leadership of France. The title of "Abbreviation" is interesting, for it is applied to the shortening of wars and of law-suits.

Dubois was probably a native of the neighbourhood of Coutances, in Normandy. He studied in the University of Paris, and refers to having heard Thomas Aquinas discourse in the University. He practised as "avocat des causes ecclésiastiques au bailliage de Coutances" in the time of Philippe le bel. The *de Recuperatione* has a special English interest, because it is addressed to King Edward I, and it does not seem unlikely that Dubois had performed professional services for the English king (Langlois: "Introduction," p. xi). Naturally, however, a treatise on the "recovery of the Holy Land" found a suitable patron in the Crusader king, and the largeness of imperial view of Edward I probably made him as little unsympathetic a listener as could be found in that age.

General Views. Dubois, then, may rank as a precursor of protests against "Papal iniquities" and abuses in the Church, though, of course, there is no hint of detachment from Church dogmas; and as a precursor of law codification and simplification, which saw its fulfilment only at the end of the

eighteenth century. The idea of the federation of the countries of Europe may well draw future attention to this mediaeval thinker. Remarkable as these views are in one who lived over six hundred years ago, they are paralleled by his educational suggestions, which have been overlooked, too long, in England.

As Dr. Poole points out (p. 259), to the mediaeval mind only the two extremes are possible: either absolute obedience to the sovereign, or absolute obedience to the Church. So with Dubois. He passes over absolutism from the Church to the State in all temporal affairs. Hence his provision for education is founded upon the idea of confiscation of ecclesiastical funds. Monasteries were to be dissolved so as to advance political ideas; precisely as, afterwards, in the case of Henry VIII and his coadjutors, the finances were to be devoted to educational purposes. As Henry VIII, later, justified his confiscation of monasteries by saying that he was "minded" to erect "divers and sundry" grammar schools for boys: so the earlier Dubois suggested the confiscation of nunneries, with a view to the better and wider education of girls. The scheme thus put forth for the education of girls anticipates, by six and a half centuries, the ideas of the high schools for girls in England. (See GIRLS AND WOMEN IN ENGLAND, EDUCATION OF.)

But Dubois pleads for the higher education of both boys and girls as a necessity for the State. Even if the Holy Land be conquered, the people assembled there in the conquering armies need guidance. "Places do not sanctify men, but men places." Physicians are necessary for the mind as well as for the body. Thus for those in authority, political and ecclesiastical men are necessary who should know Arabic and Arabic writings. For purposes of evangelization, bishops (said to number 900) ought to have amongst them Oriental scholars, to bring Orientals as well as Westerns to the unity and obedience of the Roman Church; and this result cannot be achieved without a knowledge of Oriental languages. Hence dragomans, or interpreters, must be trained, who will be able to disseminate the Christian answers to the objections of barbarians, and to destroy their erroneous opinions by incontrovertible reasons. Priors of Knights Templars, or Hospitallers, should be required, in suitable places, to have associated with them two or three schools of boys, and as many of girls, to be kept at studies for four or five years; if possible, pupils should come from noble families.

Importance in Education. Chosen by philosophers trained in reading dispositions of children at four or five years, or at six years of age at latest, only those will be retained whose progress shows real promise. Each school will contain, at most, 100 of these select pupils. They will read the Psalter, practise singing, study Donatus (see DONATUS, ÆLIUS), read Cato and other of the easier Latin authors. They will all speak in Latin always; they then will study the Bible, the Gradual, the Breviary, the Missal, the legends of the saints, and stories from the poets. Then will follow Higher Grammar of Alexander of Villidieu and the *Grammaticus* of Ebrard of Béthune. Logic will be taught by abstracts. Greek and Arabic, or other Oriental languages, will then be studied. This completes the course to the end of the fourteenth year. Then begins natural science, ethics, rhetoric, and politics—all taught in summaries. Then follow the studies

in Law and the Decretals, especially for those who will be laymen. Students of less ability, after studying the elements of logic and natural science, proceed to surgery (both of men and of horses); and the most capable students, medicine. Physicians and surgeons should marry women equally skilled in medicine and surgery. In addition to all the above knowledge, prelates ought, by 30 years of age, to be skilled also in philosophy, theology, civil and common law. Some pupils, at least, should be trained in mathematics and astronomy. With the educational funds taken from abbeys, schools would supply the knowledge of such value, that its application to the production and exchange of Western goods would lead to the acquisition of the rare and precious things of the East for "almost nothing." Thus the higher education of the Christian bishops is necessary for their own good and for the spiritual good of the Oriental world, and for the material and economic advantages which ensue from the application of the best worldly wisdom in industry and commerce. Dubois marks the highest point of contemporary insight into the significance of the Crusades, in international relations, based upon educational methods.

F. W.

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DUELLING IN UNIVERSITIES.—Duelling was brought to an end in this country by the efforts of the Prince Consort, but on the Continent it still lingers, and the practice in German universities has frequently been advanced as an objection to German university life. The *Mensur*, as it is called, is really a fencing match, and the quarrelsome and swaggering student, given to frivolous playing with his own life or with that of another, has done much to bring duelling into contempt. But the *Mensur* is a test of courage and a training in skill, which tends to secure to its possessor a certain degree of esteem among his fellows.

DUKE OF YORK'S SCHOOL (or Royal Military Asylum, Chelsea).—Situating north of the Royal Hospital for wounded and superannuated soldiers. It was founded by the Duke of York, son of George III, in 1803, for the support and education of children of soldiers of the regular army, who remain there until old enough to enter into employment. The building comprises three sides of a quadrangle, and is surrounded by extensive grounds. The children admitted are orphans, or those whose fathers have died during service, or whose mothers are dead and whose fathers are on service abroad, or whose parents have other children to maintain. About seven hundred boys and three hundred girls are provided for. All receive a good general education, the boys also undergoing a regular military training. Distinctive dress is provided for each sex. The management is in the hands of Commissioners appointed by the Government, and Parliament makes an annual grant in support of the institution.

DULL CHILDREN, THE PROMOTION OF.—(See ORGANIZATION, SCHOOL.)

DULWICH COLLEGE.—"The College of God's Gift at Dulwich" was founded, in 1619, by Edward Alleyn, the celebrated actor. The old buildings form three sides of a quadrangle, and include the chapel and the Lower School (now called Alleyn's School), in which about six hundred boys receive a secondary education under the Board of Education. The Upper School, the College proper, was, in 1870, transferred to new buildings of Italian architecture, which cost nearly £100,000 to erect. It provides accommodation for more than seven hundred boys. The annual income, derived from rents of the manor of Dulwich, amounts to £20,000. On Alleyn's foundation there is also an almshouse for the support of twelve poor brethren, twelve poor sisters, and twelve out-pensioners. There is a fine picture-gallery, especially rich in paintings of the Dutch school, which was left to the College, in 1810, by Sir Peter Francis Bourgeois, the painter. The Upper School is divided into four sides: Classical, modern, science, and engineering; and there is a preparatory school. The four boarding-houses each contain twenty-five boys. The annual value of the entrance scholarships, which, as usual, cover tuition fees, is £500; and there are leaving exhibitions of total value £1,000 a year, tenable for four years at the universities or elsewhere. Cricket and Rugby football are games at which Dulwich excels.

DUNDEE, UNIVERSITY COLLEGE.—Founded, in 1880, by Dr. J. B. Baxter and his sister, Miss M. A. Baxter, who gave £50,000 for foundation purposes and £100,000 as an endowment, University College, Dundee, was opened in 1883 to supply education in arts, science, law, and medicine to students of both sexes. There are upwards of two hundred and fifty students in the day classes, and the evening students are very numerous.

In 1897, the College became a constituent part of the ancient University of St. Andrews, the oldest of the universities of Scotland. Religious tests are expressly excluded under the deed of endowment. Besides the usual degrees, a B.Sc. in Engineering is conferred; and there is a medical school.

DUNFERMLINE COLLEGE OF HYGIENE AND PHYSICAL EDUCATION, THE.—This college for the training of teachers of Physical Culture is governed by the members of the Carnegie Dunfermline Trust (*q.v.*) and serves a directly beneficial purpose throughout the country. It is recognized by the Scottish Education Department as a Central Institution for the training of Specialist Teachers of Hygiene and Physical Exercises, and grants a diploma in Hygiene and Physical Education. Inaugurated in 1905, the College already occupies a unique place as an educational institution.

The Principal is also the Medical Officer in charge of the Medical Inspection and Physical Training schemes of the Trust. By arrangement with the Scottish Education Department, three members of the College staff at a time are employed as Assistant Inspectors of Physical Training in Scotland, and, after a period of service in this capacity, they return to the College as teachers and lecturers, another three members of the staff being selected to carry on the work of inspection. This arrangement ensures that the College work is carefully moulded

to school requirements. The New College Building is the headquarters of School Medical Inspection work, and includes the General, Dental, Remedial, and Eye Clinics for school children. Assisting in parts of School Medical Inspection and School Clinic work, the student becomes familiar with the commoner methods of detecting defect and the simpler forms of treatment. All the public schools of the town are available for teaching practice, and students conduct classes in playground, classroom, central hall, and fully-equipped gymnasium. The College offers separate courses of training for men and women. The ordinary course of study lasts two years, and leads to a qualification under Article 47 (b), foot-note (f) of the Regulations for the Preliminary Education, etc., of Teachers. There is a special one-year's course of study offered to male students in training for the General Certificate under the same regulations, and to men who already hold it. In the case of students in training, this additional year is regarded by the Scottish Education Department as an integral part of a course of training under Article 18 of their regulations. The college also provides a course in Physical Education under the scheme of the Ministry of Labour (Appointment Department) for the Higher Education of Ex-Service Officers and Men. A. MACKENZIE.

DUNFERMLINE TRUST, THE CARNEGIE.—(See CARNEGIE DUNFERMLINE TRUST, THE.)

DUNS SCOTUS.—One of the most famous schoolmen of the Franciscan Order at Oxford early in the fourteenth century. He lectured on theology and philosophy to large numbers of students at Oxford, Paris, and Cologne, and died at Cologne in 1308, while still young. His written works consist of Biblical commentaries, and commentaries on Aristotle and the *Sentences* of Lombard. Duns Scotus was the founder of a new school of thought opposed to the theories of Thomas Aquinas, and their followers were known as Dunsmen and Thomists. (The Humanists gave the name "Dunce" the meaning of dullard.) Aquinas followed Aristotle, and sought for the foundations of Christianity in speculation rather than in practice. Duns Scotus taught that theology rested on faith, and that faith was an act of will. He considered will as the moving principle of intellect, and all things as subject to it. This view led him to treat morality as depending on the Divine will: "The good is good because God commands it." (See also SCHOLASTICISM.)

DURHAM, BEDE COLLEGE.—The Diocesan College for Men Teachers, and also a Hall of Residence in the University of Durham. The College is open to those who intend to enter the teaching profession. Matriculated students take the Durham University Course in Arts, leading up to the degree of B.A. This course lasts for three years, and includes instruction and training in the theory and practice of teaching. It is possible also to enter for a four years' course, in which case the fourth year is devoted to post-graduate study in preparation for the University Diploma in Education. Students are also admitted for the ordinary two year course, which enables them to qualify as teachers holding the certificate of the Board of Education. As grants are available for intending teachers the expenses of these courses are very moderate.

DURHAM, THE UNIVERSITY OF.—Our most religious and gracious king, Henry VIII, conceived many beneficent schemes for converting to the advancement of learning and piety the revenues he pillaged from the religious houses. More often than not, the claims of some important courtier had to be met, and the Abbey lands and buildings passed into lay hands, and glorious churches, and dormers, and fraters, and cloisters, became picturesque ruins or entirely disappeared. Happily, the monastic houses of Peterborough, Oxford, Chester, Gloucester, and Bristol were spared, to become the cathedral churches of five new dioceses. Durham was then a monastic cathedral, and what was done there was to place it on a new foundation, secular in character. Part of Henry's grandiose plan was the establishment of a college or university in connection with the cathedral church for the benefit of northern students, but the scheme did not mature. In the following century, Oliver Cromwell talked of a university for Durham, and did nothing.

As far back as the beginning of the fourteenth century, the Prior of Durham, Richard de Hoton, made provision in Oxford for a few of his monastic students. In 1380, Bishop Hatfield refounded de Hoton's establishment on a larger scale. This continued as Durham College till 1540, and in 1555 Sir Thomas Pope, who had acquired the buildings and land, founded there the present Trinity College, which, of course, is no longer connected with Durham.

In 1831, in the episcopate of the learned Van Mildert, the chapter of Durham took in hand the work of establishing a university, which two years later they opened. University College and Bishop Hatfield's Hall afforded residence to the students who were attracted thither. Though the University embraced the great faculties, certain subjects could obviously be taught better elsewhere. Thus it first affiliated to itself the College of Medicine in Newcastle-on-Tyne; then, in 1871, the College of Physical Science in the same place. In this way the work of the University was conducted from two centres, but under the supreme control of the Dean and Chapter, who appointed the Warden, and formed with others the governing body. In both centres great developments have ensued in recent years. At Durham the number of colleges has been enlarged by the addition of St. John's and St. Chad's, while the training college for schoolmasters, known as Bede's College, is incorporated as a hostel of the University, and there exists also a women's hostel. In 1908, when the new conditions and the extended scope of the teaching made the old administrative arrangements difficult to work, if not unworkable, an Act of Parliament was passed reconstituting the University on a new basis. The scheme transferred property formerly vested in the warden, masters and scholars, the two old colleges, the library, the observatory, the museum, and their interest in Durham Castle to the Council of the Durham colleges. To this body was assigned the duty to maintain the two existing colleges as residential; to keep up the university institutions, and, if it should be thought necessary, to establish extension classes; also to make certain payments to the colleges—the College of Medicine and Armstrong College—which form the Newcastle division of the University's operations. It was laid down in the new statute that due regard must always

be paid "to the original purpose of the endowment and its connection with the cathedral church." The Bishop continues to be the Visitor, but an elected Chancellor now takes the place of the former Warden.

In 1895, a new departure was taken in the admission of women to the examinations and degrees, except in the theological faculty. For their convenience a hostel was provided in Durham.

At the original centre the subjects of study follow, more or less closely, the lines of the older universities of Oxford and Cambridge before the modern developments in regard to scientific research and the application of science to the industries. These branches of learning are cultivated in the Newcastle Division, where there is a fine school of medicine, and the College of Physical Science, transformed into Armstrong College by the munificence of Lord Armstrong, affords to northern students in particular the very finest training. It should be added that this university, by a system of affiliation, has given to the students in a large number of colleges up and down the country the opportunity of obtaining degrees by examination with a shortened period of residence.

One of the causes which chiefly led to the establishment of Durham University in the 'thirties of last century was the deplorable lack of education in the clergy of Northern England. Before the coming of the railways, people who lived in the villages were, in many parts of Northumberland, Cumberland, Durham and Westmorland, cut off from communication with the world. The populations were sparse, the church livings often miserably endowed, and the clergy were only too often little better educated and informed than their rustic parishioners. In these circumstances, men who were desirous of entering Holy Orders had neither the means nor the fitness to enter at Oxford or Cambridge. To remedy this evil, the ecclesiastical authorities at Durham aimed at providing a university education—at first with a lower standard of requirement—at a much lower cost than in the far-away universities in Middle England. It is, therefore, not surprising that the theological faculty is particularly prominent in the Durham division. From the first this has been the case, and, in order to encourage theological study, the diploma of Licentiate in theology is given to those who do not go on to the degrees in divinity.

In the case of Durham, we have one more illustration of the Church's solicitude for the intellectual as well as the spiritual advancement of the people. To its initiative and interest we owe the primary education of the country. To its beneficence and that of great Churchmen in the past the universities and their colleges and innumerable schools of the secondary type own their indebtedness. It was just that the Act of 1908 enacted that the like sense of indebtedness should be shown at Durham by paying due regard to the original purpose of the university's endowment and its connection with the cathedral church.

A. REYNOLDS.

DURY, JOHN (1596–1680).—A fellow-worker and close friend of Hartlib; was born in Edinburgh, but educated at Sedan and Leyden, as his family had left Scotland owing to religious difficulties. John Dury was minister of the Reformed Church to an English colony in Prussia at Elbing from 1628 to

1630. He endeavoured to bring about a reconciliation between the Reformed and the Calvinistic churches in Germany; and on returning to England in 1632, he obtained the patronage of Archbishops Laud and Ussher and entered the English Church. In 1643 he was a member of the Assembly of Divines which drew up the Westminster Confession and Catechism, and between 1645 and 1654, while in England, he wrote the *Reformed School*, to which Hartlib contributed a preface. In this work, Dury proposes the formation of a Christian Association of persons who are to live a common life according to rule, and to provide the means by which the Reformed School is to be carried on. The school is to provide a reformed education intended to make "good Commonwealth's men," apt in husbandry, trade, navigation, and administration in peace and in war. The school is to be a boarding school for fifty boys, with a governor and three ushers. The educational aims of the school are Godliness, bodily health, manners, and, "last and least part of true education, proficiency in learning." Nothing was to "be made tedious and grievous to the children, but all the tediousness of their business the Governor and the Ushers are to take upon themselves." Dury devotes a large part of his book to a discussion of education in general. He criticizes contemporary education as superficial and devoted to words, and neglecting things; advocates the teaching of sciences; the study of the "Children's Natural Capacities" as an aid to teaching; and the co-ordination of subjects of instruction. (See also *JESUIT EDUCATION*.)

DUTCH COLONIES, EDUCATION IN.—The oldest and the largest of the colonies of the Netherlands are situated in the East Indies, and include the Sunda Islands, the Moluccas, and portions of Borneo and New Guinea. The inhabitants are chiefly of Malay race, and number about 40,000,000. In many parts of Java there are large settlements of Chinese, and in the smaller islands, black people of various races. Java was conquered by the Arabs in 1478, and has been under Mohammedan influence since that time. The religion is chiefly Mohammedan, mingled with Buddhism. The Dutch took possession of Java in 1575, but did little in regard to education until 1848, when small grants were first made. State schools for native children were first established in 1854, and about twenty years later the whole system of native education was organized and established. At present, provision is made separately for native children, and for the children of people of white races. For European children, schools are provided resembling those of Holland. In 1913 there were 17 middle-class schools with 2,419 pupils and 260 teachers. These were supported entirely by the Government at a cost of 1,231,488 guilders (£102,624). There were also 7 private schools with 381 pupils and 58 teachers, to the support of which the Government contributed 107,489 guilders. Elementary education was provided in 171 mixed public elementary schools (22 for girls only, as well as 26 for Chinese girls) and 35 private schools. In these schools there were 1,270 public and 210 private teachers, and the pupils numbered 28,123 (including 9,172 natives) in the public schools and 5,444 in the private schools. The cost of elementary education to the Government was 3,302,683 guilders. The most important secondary school is the Gymnasium at Batavia, which provides a five-years' course similar to that

of the higher burgher schools in Holland, and prepares pupils for the Dutch East Indian Civil Service. Technical instruction is also given in schools in Batavia.

The Education of Natives. The schools for Europeans are (as shown above) open to natives, but exist only in the largest trading towns. For native education elsewhere, considerable provision is made. In 1913, there were 7 normal schools, with 46 teachers and 644 pupils, in Java, Sumatra, and Amboina. The instruction is provided free of charge, with allowances for maintenance. A five-years' course is arranged comprising languages, mathematics, land surveying, physical sciences and drawing, and a thorough training in the science and practical study of school organization and teaching. In Java and Madura there are 816 public and 489 private schools for natives, with about 150,000 pupils, and in the Outposts, 443 public schools, with 61,437 pupils; and 1,987 private schools, with 109,000 pupils. In these schools instruction is given in the Malay tongue, but in the first-class schools of this kind, part of the instruction is given in Dutch. A lower class of school in rural districts, known as the *dessa* school, was introduced in 1906. In the *dessa* schools, which in 1913 numbered 3,437, about a quarter of a million native children receive a very elementary education limited to reading, writing, and the principles of arithmetic. The teachers in these schools are chiefly natives, and their development is accompanied by increasing attention to the training of native teachers. The cost to the Government of native education in 1913 was nearly 6,000,000 guilders, or about £500,000. Schools for Chinese children have been established in many of the chief towns in Java, Celebes, Borneo, and Sumatra. They are organized on the same plan as the lower schools for European children. In Dutch Guiana, the population is composed of many races, including South American natives, Negroes, Hindus, and Chinese. A Government normal school has been established at Paramaribo, and there are 27 public elementary schools in the colony, with about 3,300 pupils. Some forty private schools provide education for 6,600 other children.

DUTCH LANGUAGE AND LITERATURE, THE.

—The name "Dutch" sufficiently indicates the parentage of the language thus called. In the Middle Ages it could be applied to any dialect of Continental West Germanic, Frisian alone excepted. Dutch, therefore, was also a name for that particular West Germanic dialect, called West Franconian by philologists, which went to the making of the modern Dutch language. Two other West Germanic dialects are spoken in the Netherlands: Saxon in the county of Zutphen and the provinces of Overijsel and Drente, and Frisian in the province of Friesland. Blendings of Frisian with Franconian, of Franconian with Saxon, and of Saxon with Frisian have given rise to a great number of dialectal varieties. In the Middle Ages, a literary standard developed from the Franconian dialects of Flanders and Brabant in the south; but, after the subjection of the southern Netherlands to Spain (c. 1585), it was gradually superseded by the growing importance of Hollandish, which is a type of Franconian modified by an immixture of Frisian. The rise of the Northern Netherlands as an independent political unity disintegrated from the German Empire (1648), found its expression in the name which the Netherlands began to

substitute for the mediaeval term Dutch: they called it Hollandish after the dialect of the most powerful of the United Provinces, the name Dutch (*Duitsch*) becoming restricted to the German language. After the eighteenth century, Dutch was no longer called by that name by the Hollanders themselves. It is in English alone that it has retained its ancient meaning. A more bookish and official term is Netherlandish (*Nederlandsch*), which, however, is preferable to Hollandish as being applicable also to those varieties of Dutch which are not spoken within the kingdom of Holland. These varieties are: (1) the dialects of the Netherlandish population in Belgium and the North-West corner of France, conveniently, though not quite correctly, called Flemish, its area extending from the Dutch frontier to a line which, roughly speaking, runs from Visé over Waterloo and Meenen to Grevelingen, west of Duinkerken; (2) the language of the Boers in South Africa, so-called Africander or Cape Dutch, a strongly simplified form of the language with hardly any inflections and without a grammatical gender. The Dutch language of Holland is also spoken by the ruling class in the Dutch East and West Indies. Dutch, accordingly, is the language of such great emporiums as Amsterdam, Rotterdam, Antwerp, Batavia, Semarang, Surabaya, Paramaribo, and (though here second in position to English) Capetown.

Literature. The literature of Dutch has produced few works of high excellence, the earliest being the thirteenth-century poem, *Van den Vos Reinaerde*, which, through the medium of a Dutch prose version, became the source of Caxton's *Reynard the Fox*. The thirteenth and fourteenth centuries were a period of active literary achievement in the Southern Netherlands, but the two following centuries were barren of genius. Only towards the end of the sixteenth century did the Renaissance give a fresh stimulus to the dormant literary talents of the Dutch. Amsterdam was the centre of this revival, and Vondel its greatest genius. He excelled in lyrical and dramatic poetry. As a playwright, he is best remembered by his *Gysbrecht van Aemstel*, a dramatic treatment of an episode from the early history of Amsterdam, and by a few of his Biblical plays (*Josef in Dothan*, *Lucifer*, *Jephiah*, *Adam in Ballingschap*), which may be best described as adaptations of the mediaeval miracle play to the requirements of the classical drama. *Lucifer* is considered to be his masterpiece, an excellent translation of which was published by Mr. Ch. L. van Noppen in 1898 (2nd ed., 1917). The dramatic interest of these plays is but slight, as the poet lacked psychological insight and despised aiming at stage effects. Their enduring beauty is in the magnificent verse, thanks to which the above-mentioned plays still hold the stage. Seventeenth-century comedy is more thoroughly Dutch in spirit, as it was less affected by classical influences. Even in those plays which were adapted from Plautus and Terence (*Warenar* by Hooft, *Moortje* by Bredero), the poets succeeded in substituting the local colour and the atmosphere of Amsterdam life for those of ancient Greece. Hooft, the author of *Warenar*, is also the writer of beautiful songs reminiscent of mediaeval lyrics, and is the best sonneteer of that period. The most popular poet of the seventeenth century was Jacob Cats, who worked in the manner of the mediaeval didactic writers. He was devoid of the highest poetic quality, but had a keen eye for the realities of life, which

he depicted with loving precision. As a gnomic and emblematic poet, he has no equal in Dutch literature. But his great didactic poems (*Houwelyck, Trouwring*) are wearisome, long-winded productions, unpalatable to a modern taste. His style, in that respect, is the very opposite of that of Constantijn Huygens, who wrote a terse and vigorous language not free, however, from conceits and mannerisms. The art of prose-writing developed but slowly in Holland. Hooft's *Nederlandsche Historien*, a great achievement in many respects (1642), is a curious attempt to form a Dutch prose-style by copying the prose of Tacitus. Vondel, though an equally devoted student of Latin authors, chose a more independent way, adapting the structure of his sentence to the tendencies of his native speech. But not until the end of the eighteenth century did the Dutch prose-style acquire a freer and more natural grace in the writings of Elisabeth Wolff and Agatha Deken, joint authors of *Sara Burgerhart* and *Willem Leewend*, two novels after the manner of *Pamela* and *Clarissa*. In the early eighteenth century, English literature had begun to influence the literature of Holland, which, until then, had drawn its inspiration mostly from France and antiquity. The Romantic Revival strengthened that influence: Ossian was translated by Bilderdijk, Scott found imitators in Van Lennep and Mrs. Bosboom-Toussaint, Byron inspired Nicolaas Beets and many a lesser poet. Beets is also the author of that inestimable prose-work, *Camera Obscura* (1839), published under the pseudonym Hildebrand, in which the influence of Dickens is manifest. The greatness of Wordsworth, Shelley, and Keats was not realized in Holland until the last quarter of the nineteenth century, and their recognition inaugurated a new era in Dutch literature: the so-called movement of 1880; a reaction against the rhetorical style which the eighteenth century, through the medium of Bilderdijk's dominant poetry, had passed on to the nineteenth century; and a revolt against the homely, narrowly patriotic poetry of the two preceding generations. Two lonely figures, out of sympathy with their own time, had paved the way for this new movement: Potgieter, critic, essayist, and poet; and the prose-writer, Douwes Dekker, better known by his pseudonym Multatuli, the author of *Max Havelaar* (1860, transl. into English by Baron Alphonse Nahuys, 1868).

"L'art pour l'art" was the maxim of the new movement of 1880, whose chief exponents were the poet and critic Kloos and the essayist Van Deyssel. The greatest poem of this period is *Mei* by Gorter. The extreme individualism of this school left its adepts disillusioned, and drove some of them to the other extreme: Gorter, Van Eeden, Mrs. Roland-Holst van der Schalk became the poets of Socialism. The two chief novelists of that generation are Marcellus Emants and Louis Couperus, the most versatile and most productive writer of fiction in Holland. They were in sympathy with the Amsterdam pioneers of 1880, but maintained an independent attitude towards them. The youngest generation of writers counts several talents in nearly every field of literary activity: the novel (Van Suchtelen, Querido, Ina Boudier-Bakker, Herman Robbers, Scharren-Antink, Jop Naeff), the drama (Heyermans, Schürmann, Mrs. Simons Mees, Fabricius, Mrs. Van Ammers-Kuller, Van Suchtelen), poetry (Boutens, Adama van Scheltama, Geerten Gossaert). Dutch Belgium has also witnessed a revival of letters: the beautiful poetry of Guido Gezelle

(d. 1899) has been a source of inspiration to many Flemings of the two succeeding generations, and Flemish prose fiction ranks almost equal with that of Holland (Stijn Streuvels, August Vermeylen, Herman Terlinck, Felix Timmermans). Since the South African War, Cape Dutch has also begun to contribute its share to Netherlandish literature: the poetry of Totius, Leipoldt, Malherbe, bears great promise for the future.

Characteristics of the Language. Special characteristics of the spoken language are: (1) the unvoicing of voiced consonants (*b, d, g, v, z*) in final position. In the case of *b, d, g*, this change is not reflected in the spelling, but *v* and *z* at the end of a word or syllable are always spelt *f* and *s* (e.g. *haas*, "hare," plur. *hazen*; *hefde*, pron. *iwde*). (2) The dropping of final *-n* of weak syllables, although it is retained in the spelling. (3) The articulation of *g* as a voiced open sound, both initially and medially between voiced sounds. (4) The articulation of *w* as a lip-teeth, more like English *v* than *w*. (5) The sound group *sch* (pron. *sx*) occurring only at the beginning of stressed syllables except before *r*. At the end of a syllable, initially before *r* and at the beginning of unstressed syllables, *sch* is pronounced *s* (e.g. *schip*, "ship" [pron. *sxip*]; *Engelsch*, "English" [pron. *aenəls*]; *Engelschen*, "Englishmen" [pron. *aenəlsə*]). In the simplified spelling, which is not officially recognized, *s* is always spelt where the following *ch* has become mute. (6) The coalescence in sound of the diphthongs *ij* (from Middle Dutch *i*) and *ei*, which are still kept apart in the spelling; hence *meid*, "maid," and *mijt*, "mite," are homonyms (pron. *meit*).

The morphology of Dutch is much simpler than that of German and more difficult than that of English. It has two grammatical genders: nouns are either neuter (i.e. they take the article *het*) or non-neuter (i.e. they take the article *de*). In the official orthography, the fiction of a triple gender is still kept up, *de* being inflected one way before original masculine nouns and in another way before so-called feminines. But, in practice, *de* is indeclinable, and the simplified spelling leaves it uninflected. Apart from the difference in form between singular and plural, there is no inflection of nouns; only names of persons form a possessive in *-s*. Verbs are conjugated either strong (i.e. with vowel change in the preterit and the past participle) or weak (i.e. forming their preterit and past participle by appending the suffixes *-de* and *-d* or *-te* and *-t* after verbal stems ending in a voiceless consonant).

The structure of the Dutch sentence is very much like that in German. In principal sentences the verb is inseparable from its subject; but in dependent clauses it is divided from it and stands at the end of the clause, e.g. *God zag dat het goed was*—"God saw that it was good." The two component parts of periphrastic verbal forms are always separated, the auxiliary standing next to the subject and the main verb being relegated to the end of the sentence, e.g. *Niemand kan twee heeren dienen*—"No man can serve two masters."

A. J. BARNOW.

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DYCE, REV. ALEXANDER.—(See SCIENCE AND ART MUSEUMS, SOUTH KENSINGTON.)

DYNAMICS, THE TEACHING OF.—(See MECHANICS. THE TEACHING OF.)

E

EACHARD, JOHN (1636-1697).—Entered Catherine Hall, Cambridge in 1653, and after taking his M.A. degree and becoming a fellow of the College, was appointed master in 1675. In 1679 he became vice-chancellor of the University, and in 1687 represented it in its refusal to confer the degree of M.A. upon a Benedictine Monk at the bidding of James II. He was a successful and popular master of his college as well as vice-chancellor. In 1670 he published anonymously a volume on the grounds for the contempt into which the clergy had fallen, attributing it chiefly to their poverty and to wrong methods of education. Three years later he published a letter on the causes of the great esteem and honour that "the Nonconformist Preachers are generally in with their followers." His works are full of wit and humour, "solid learning mixed with many strokes of raillery," and commanded a ready sale.

EARLY ENGLISH TEXT SOCIETY, THE.—Was founded by Dr. Furnivall in 1864 for the purpose of bringing Old English Literature within reach of ordinary students, and of arousing interest in the monuments of the early language and life of England. In the early years of the society so many important texts were taken in hand that it became necessary to open in 1867 an *Extra Series* in addition to the *Original Series* with which the society began.

The *Extra Series* is devoted chiefly to fresh editions of all that is most valuable in printed MSS., and in Caxton's or other black-letter books.

The Publications of the year 1864 were: *Early English Alliterative Poems*, about A.D. 1360, edited by the Rev. Dr. R. Morris, *Arthur*, about 1440, edited by F. J. Furnivall, M.A.; *Lauder on the Dewtie of Kyngis, etc.*, 1556, edited by F. Hall, D.D., *Sir Gawayne and the Green Knight*, about 1360, edited by the Rev. Dr. R. Morris.

In three years the membership of the society rose from 145 to 409, and the number of publications increased proportionally, while the demand for the texts increased so rapidly that stocks were quickly exhausted, and in 1867 a Reprinting Fund was established, and the ordinary issues raised from 500 to 1,000.

At the same time the society combined with the Philological and Camden Societies in the production of certain of the texts. The Kent Archaeological Association also took steps to circulate the Society's edition of *The Aenbite of Inwyt* (Dr. Morris) an important work on the early Kentish dialect.

To encourage the study of its Texts the society offered copies of the first twelve, published in 1864 and 1865, as prizes in universities and colleges, and the early members of the Society such as Dr. Morris, Professor Hales, and Mr. Furnivall, carried the work still further by the publication of *Early English Extracts*, *Percy Reliques*, and similar

collections. Some of the earliest editions of *Piers Plowman*, edited by Dr. Morris, were issued in 1867, and to the Rev. E. A. Abbott belongs the credit of having introduced his text as a class book of his highest form.

The Texts were arranged in several classes. The class of Romances includes many Texts on King Arthur, Sir Tristram, Charlemagne, etc. The dialectal works and dictionaries form a second class, and religious works a third, and a fourth class is described as miscellaneous.

About 150 Texts have been published in the original series, among which are the following: *Merlin*, Parts I, II, III, about 1440 (edited by H. B. Wheatley); *Morte d'Arthur*, about 1440, (E. Brock); *Pierce the Ploughman's Crede*, *Piers Plowman*, several editions by Professor Skeat; *Sir David Lyndesay's Works*, (E. Hall); *Cursor Mundi*, (Dr. Morris); The original MS. of *Beowulf* (Prof. D. Zupitza); *King Alfred's Writings*, (H. Sweet); *Bede's Ecclesiastical History*, (Dr. T. Mallet); *The Laud MS Troy-Book*, (Dr. J. E. Wulfung); *The Brut*, (Dr. F. Brul); *The Coventry Leet-Book*, (Miss M. Dormer Harris).

The annual subscription, which constitutes membership of the Society is one guinea for the Texts of the original series published during the year. The number of publications may be two or more according to the cost of production. In 1912 and 1913 only two were published each year, with one reprint issued in 1913.

In the extra series about 120 Texts have been published, including: Caxton's *Book of Curtesye*, in three versions (Furnivall); *Havelock the Dane* (Skeat); Chaucer's *Boethius* (Dr. Morris); *Guy of Warwick* (Zupitza); *Gesta Romanorum* (Heritage); *Charlemagne Romances*, 12 vols. (Lee); Many of *Lydgate's Works*; Caxton's *Mirror of the World* (Prior); Gower's *Confessio Amantis* (Macaulay).

The subscription to this Series is one guinea annually. Each Text is published at a separate cash price, and members may purchase copies of back Texts at a reduction of one-third of the published price. The publishers are the Oxford University Press, Amen Corner, E.C.4.

EARS, THE CONSIDERATION AND TREATMENT OF CHILDREN'S.

The appearance of the Aural School-Clinic is one of the most important developments in the aural treatment of this generation. Treatment during the school period is not only more effective than treatment in adult life, but it is, to a large extent, preventive. If it were thoroughly and universally applied, nearly all the intra-cranial complications of ear disease which demand surgical interference would be avoided, and much of the deafness which makes adult life dull and ineffective would never occur. The effectiveness of treatment during the school period arises from two facts: it is done by nurses, and it is regularly done. When a child with a running ear

comes for advice to the outdoor department of a hospital, he must attend twice or three times a week over a long period. Such absence from school—for each attendance means an absence of half a day—is ruinous to education; it is scarcely less ruinous to the home of the child, for the mother, or some other member of the family, has, in most cases, to accompany the child.

The children under the Glasgow Authority number over 100,000. Of these, during three years, about 3,250 cases have been sent up suffering from discharging ears or deafness, or both. Over 750 of these children had masses of wax in their ears; over 1,400 had active suppuration in the middle ear; 750 showed evidence of past suppuration, although no discharge was present at the time of the examination; 774 had mouth-breathing, or other evidence of blocking of the naso-pharynx, associated with deafness; whilst 128 suffered from disease, mostly suppurative, which was found to be incurable without some major operation in the middle ear. Thirty or forty cases of congenital syphilis and deafness were discovered. About 100 cases of deaf-mutism, congenital and acquired, had to be sent to special schools. If the regular treatment is left in the hands of the mother or guardian, with only occasional visits to the hospital, the treatment is apt to fail, for the thorough cleansing and drying of a running ear requires more skill than the mother possesses.

Perhaps the oldest Aural School-Clinic in this country is that of the Institution for the Deaf and Dumb at Langside, Glasgow, where for about a quarter of a century the writer has treated the suppurating ears and removed the post-nasal adenoids of the children.

In 1909, under the name of inspection, treatment of the children at the Semi-Deaf and Semi-Mute School in Glasgow was undertaken; and, in 1912, treatment, in regular clinics, of all the school children under the Glasgow School Board suffering from discharging ears or deafness, or both, was commenced, and has been carried on under the writer's care. Such is the experience amongst school children on which the conclusions of this article are founded.

These conclusions are—

1. The treatment of middle ear suppuration in children at Aural School Clinics is very satisfactory. In most cases, permanent arrest of the discharge can be effected without operative treatment of any kind. In many more cases, operative treatment of the naso-pharynx, along with careful dressing of the discharging ears, results in cure. In some cases, the dressing of the ears has to be continued for two, or even three, years before discharge ceases. The most obstinate cases result from measles and scarlet fever, which together account for 20 per cent. of the suppurating ears of children. At present, measles is considered by the public to be a trifling disease. It is really very destructive of life, and very productive of middle ear disease and deafness. It should be notified like scarlet fever and, like the latter, be treated in an isolation hospital, especially when it occurs in the overcrowded dwellings of the poor. The suppurating middle ears of children who have scarlet fever and measles should be treated to a finish in the fever hospital by an otologist, even if operation be necessary for cure. After the middle ear suppuration of the child has been arrested, and

during the progress of treatment, water should be carefully excluded from the ear, and the use of the school bath, unless the ears be carefully protected, should be prohibited. Great patience should be exercised in the treatment of the middle ear suppuration of school children. Where only one ear is affected, one has, surgically, a free hand; and the principles guiding the surgeon are the same as in suppurative disease occurring in the adult. Where both ears are affected, the principles are modified by the special conditions belonging to the child, who has not yet attained a full vocabulary; who is not yet equipped mentally for the work of life; and whose chief asset for that attainment and equipment is his sense of hearing, which, in the schoolroom, is by far the most important gateway of knowledge. The probable effect of any operation on the sense of hearing has to be taken into account more carefully in the school child than in the adult.

Results of Treatment in a Clinic. Although the present results of the treatment of middle ear disease and deafness are good at the School Aural Clinics, they will be better when the post-nasal space can be attended to in all cases of middle ear suppuration. At present, this is not possible at the Aural School Clinic, for operative treatment is not provided by the Education Authorities. There is lack of co-operation, and often open antagonism, between the hospital and the School Clinic. Logically, no doubt, the authority which cleans out a school child's ear may also operate on his naso-pharynx. Logically, also, the Education Authority may also perform the mastoid operation and open the school child's inter-cranial abscess. In practice, the Education Authority stops at cleansing, and by this means tries to arrest the progress of suppurative diseases of the ear. The best results cannot be got until either (1) the Education Authority assumes the whole responsibility for the treatment of children's ears, including all the operations practised in fully-equipped hospitals; or (2) comes to some arrangement with existing hospitals for the operative treatment of ear disease.

Syphilitic Deafness is not common in school children—about 1 per cent. of those sent up have this type of deafness. But every syphilitic deaf child will lead the clinical observer to a family which has been or is being ruined by a constitutional disease. The family picture thus got is a large number of conceptions, a large proportion of still births, a large percentage of deaths during the first two years of life (chiefly from syphilitic meningitis), and the association with the deafness of blindness due to syphilitic disease of the eye. Syphilis is thus the most disastrous disease amongst us from the point of view of the individual, of the family, and, as a consequence, of the nation. When it occurs in the child, syphilis should be notifiable like any other infectious disease, and the whole family put under treatment. There is no known treatment of syphilitic deafness which is, in any sense of the word, successful.

Educational Results. As a minor but still important result of treatment, it should be noted that teachers have offered spontaneous testimony to the improvement in educational progress which has occurred. Not only has the arrest of suppuration and the removal of post-nasal adenoids been followed by improved hearing, but the removal of ceruminous masses and of foreign

bodies has given a similar result, and greater educational progress has taken place. J. K. L.

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EAST LONDON COLLEGE.—(See PEOPLE'S PALACE AND EAST LONDON COLLEGE. POLYTECHNICS, THE LONDON.)

ECCENTRICITY.—(See INDIVIDUALITY.)

ECLECTIC METHOD (or eclecticism) —This arose among Greek philosophers in the last two centuries B.C. It was an attempt to reach a degree of knowledge sufficient for human guidance by *selection* from existing systems of philosophy.

ÉCOLES MATERNELLES.—(See EXPERIMENTS IN RURAL DISTRICTS ON THE CONTINENT, EDUCATIONAL.)

ECOLOGY.—(See BOTANY, THE TEACHING OF.)

ECONOMIC ASSOCIATIONS OF FRIENDS OF THE COUNTRY.—(See CAMPOMANES.)

ECONOMIC GEOGRAPHY.—(See GEOGRAPHY [COMMERCIAL], THE TEACHING OF. GEOGRAPHY [ECONOMIC] THE STUDY OF.)

ECONOMICS AND POLITICAL SCIENCE, THE LONDON SCHOOL OF.—The great depression in the United Kingdom during the period 1875 to 1886 was acutely felt. Many Parliamentary Commissions sat to investigate what they hoped were merely temporary phenomena, and to devise remedies. Their reports demonstrated that grinding poverty, though accentuated by industrial depression, was not due to merely passing causes, but was, to a greater or lesser degree, always present. An awakened public conscience wanted to "do something," but was faced with an absolute lack of knowledge of how to set about it.

This impulse toward social reform was reinforced in the last decade of the nineteenth century by the growing rivalry of Germany in the commercial, and of the United States in the manufacturing world. The supremacy of this country was challenged, and the favourite remedy was that of providing a commercial education of the higher and more intelligent kind to which so much of the German success was due. For this, it was obvious that the study of economics was an indispensable preliminary. None of the existing institutions was, however, in a position to give the training so urgently required for teachers of commerce, for commercial men, and for public administrators; or to furnish the knowledge so obviously necessary as a foundation for social betterment schemes.

Lectures, sparsely attended, were given at University College and the Birkbeck Institute almost exclusively on economic theory; Oxford and Cambridge had each its Professor of Political Economy; but to have one Professor of Political Economy at a university is about as useful as to have one Professor of Natural Science. No one man could adequately teach the whole range of subjects which must be included in any reasonable survey of Economics, let alone stimulate and guide research work in all branches. Hence the teaching of Economic Theory tended to become unreal, and

was deemed mainly suitable for the person with a mathematical mind, who could follow the mathematical proof of economic "laws."

Beginnings of the School. The School of Economics was founded, in 1895, to fill this great gap in the English higher educational system. Its inception was due to Mr. and Mrs. Sidney Webb; and on their ideas of the study of the phenomena themselves—rather than upon theories about them—its plan was laid. With funds fortunately placed at their disposal by an unexpected legacy, they deliberately started an institution of university standard, in which both teaching and research in all branches of Economics and Political Science were to find a place. They aimed at attracting a group of men and women representing all shades and varieties of opinion, who, as teachers and students, would co-ordinate Economics—the term being used in the widest sense—with such cognate subjects as Public Administration, Sociology, History, and Geography; and who, as specialists in particular branches, would stimulate each other as well as their pupils.

The institution proved from the beginning a success. Although the first students had nothing to gain in the way of a degree, certificate, or prospect of promotion, they flocked to the School. Owing to the wise generosity of the London County Council, which gave a grant of £500 in the first year, increased to £1,200 from the year 1896-1897 onward, the School developed also as a place of higher commercial training. It rapidly outgrew its premises in the Adelphi; and moved, in 1902, to Clare Market, just off Kingsway, to a building erected mainly by the generosity of the late Lord Rothschild and Mr. Passmore Edwards, and enlarged in 1906. By 1920 it had further outgrown its space, and new buildings are now in the course of erection.

The University of London, recognizing the success of the new teaching, constituted, in 1900, a new faculty termed "The Faculty of Economics and Political Science (including Commerce and Industry)," and admitted the School as a constituent part of the University, practically monopolizing the whole of the new Faculty. The School thereupon began, in addition to its other work, to prepare students for the newly-established B.Sc. (Econ.) degree; and also for the D.Sc. (Econ.), which is earned by the production of a substantial book containing the results of original research. The theses presented for this degree, as well as other publications by persons working in connection with the School, have gone some way towards filling gaps in Economic literature. In 1919 it undertook the work of preparation for a new degree, the B.Com.

Influence, Administration, and Scope. Naturally, the School quickly found imitators. The older universities revised their standards of economic teaching, made this somewhat more concrete or "realistic," and added additional lecturers. The newer universities started economic teaching and training for research on the lines of the School of Economics.

The School has been the model, too, for much of the economic teaching developed in recent years on the Continent. It has been copied extensively in the new German foundations in Cologne, Mannheim, Leipzig, and Hamburg; while to various other places in Belgium and Switzerland it has been the parent institution, its courses of lectures being closely followed and imitated. Year by year, students come to it in numbers from every country in Europe; from all the larger dependencies and Colonies; from

India and the Far East; from Chile, Brazil, and the United States. There were no fewer than 321 foreign and Colonial students enrolled in the academic year 1919-1920 out of the total of nearly 3,000.

The head of the School is the Director, who acts with a Board of Governors and a Council of Management. The first Director, Mr. Hewins (afterwards Unionist Member of Parliament for Hereford) gave place, in 1903, to Sir Holford Mackinder, who, in turn, entered Parliament as Unionist Member for Camlachie in 1908, and was succeeded by the Hon. W. P. Reeves, at the time High Commissioner for New Zealand, and previously Minister of Education, Labour, and Justice in that dominion. In 1919 he resigned, and was succeeded by Sir William Beveridge, K C B., formerly permanent Secretary of the Ministry of Food.

Annual courses of lectures are given at the School dealing with Economic Theory, Statistics, Foreign Trade, Public Finance, Accountancy and Business Methods, and History—mediaeval and modern—(Economic, Constitutional, Colonial, and Political History being dealt with by separate lecturers as specialized branches of the subject). International, Constitutional, Commercial, Industrial, and Railway Law—each has its own department and lecturer in charge. Geography is equally specialized in its historical, political, and economic branches. Sociology (theoretical and practical), Ethnology, Central and Local Government, the History of Political Ideas, Banking, Currency, Transport, and Librarianship, have big main courses allotted to them. In every department provision is made for training in research; and practical investigations are undertaken in various seminars. Occasional courses and special lectures are also given on subjects of peculiar contemporary interest. For eight years prior to the outbreak of war, the War Office sent yearly thirty officers of the rank of captain and upwards to be specially trained in a course devised with a view to military administration and requirements, and this course was resumed in 1920. There is also special training provided for railway men, consuls and social workers. Students are admitted at very low fees to separate courses. In the year 1919-1920, the School, grown to be the most extensive institution of Economic teaching in the world, had a staff of forty-eight professors, readers, and lecturers, to whom were attached nine assistants, four special tutors being allotted to the Department of Social Science and Administration.

The total number of men and women students enrolled during the session 1913-1914 was 2,127; of these, 368 were university graduates pursuing their studies further or engaged in original research. In the first two terms of the session 1919-1920, 2,825 students were enrolled.

An original feature of the School, existing from the beginning, is that it is designed to attract equally both day and evening students, so as not to exclude those whose systematic education has prematurely ceased owing to the fact that they are engaged during the day. A number of the principal courses given by the chief lecturers are duplicated, being given in the evening of one day and repeated on the morning of another. Thus it is not a college intended, in the main, for day students, with an evening department staffed by junior teachers. On the contrary, those who can attend only between 5 and 10, find quite as good opportunities as those

who come between 9 and 5. Evening students have realized the advantages offered to them. In the first two terms of the session 1919-1920 they numbered no fewer than 1,687. Women are, in all respects, on the same footing as men. This is true even of the students' social life. There are no separate societies which are restricted to men only or women only, either for games, debates, or more frivolous amusements. The student life is a very vigorous one, and special efforts are made to include the foreign element. L. K.

ECONOMICS, THE THEORY OF.—Economic Theory is a term now commonly used in educational nomenclature in contradistinction to Economic History, or to such economic studies as Public Finance or Transport, which (whether they are supposed to derive their principles from Economic Theory or not) have, in fact, become the subjects of separate academic disciplines. The scope and contents of Economic Theory are variously conceived. By some, the term is used to include the most important conclusions and the main lines of reasoning upon which they are based, over the whole range of what is commonly known as Political Economy, comprising the Production, Distribution, Exchange, and sometimes also the Consumption, of Wealth, as those four terms are ordinarily employed together with Public Revenue and Taxation. In this sense, Economic Theory is simply another term for what has been known as Principles, or even as Outlines, of Political Economy; or, outside England, as General Economics. By others, the term is limited in practice to the subjects of Distribution and Exchange, conceived—as by John Stuart Mill—as more or less separate, though closely connected, fields. And by others, again, Economic Theory has been practically identified with a theory of Value, and all the problems of Distribution (Wages, Interest, Profit, Rent) are viewed as cases of Exchange. These diverse conceptions of the scope of Economic Theory have also, as it happens, been accompanied by different methods of reasoning. Those who have understood it in the widest sense have used, like Adam Smith, both induction, or generalization from observed experience, and deduction, or argument from certain assumed premises; the former, indeed, more commonly in considering Production; the latter, in considering Distribution and Exchange. Those who by Economic Theory have understood the doctrines primarily of Distribution and Exchange, regarded as in some sense separate, have hitherto commonly pursued the deductive method and have frequently maintained its exclusive validity in Economics. And, finally, those in more recent times who identify Economics with an all-embracing theory of Value prefer, while making use of brief chains of deduction, to call their method one of Analysis; and the antithesis which they propose is not between Deductive and Inductive, Abstract and Concrete, but between Analytical and Realistic.

Economic Theory and Phenomena. It should be noticed, also, that among those whose methods are deductive or analytical there have been important differences of view as to the relation between Economic Theory and visible economic phenomena. While, to some, the conclusions of theory appear to correspond roughly to the larger features of real life and the typical facts of actual experience, so that they indicate "average" conditions in the ordinary sense of "average," which identifies it

with "usual" or "approximate"; to others they predict the ultimate result of the unchecked working of forces which are, in fact, so impeded in their operation, that they seldom, if ever, reach the expected goal. As, by these latter writers, the term "normal" has not its ordinary meaning of "usual," but designates simply the outcome towards which certain forces are conceived as striving, though perhaps never actually reaching, the "analytical groundwork," however valuable as a mental gymnastic, may be at almost any distance removed from existing conditions.

Regarded as a subject of academic study and examination, Economic Theory differs at present from the exact sciences such as Mathematics or Chemistry, and resembles Philosophy, in that there is no clear consensus of opinion among influential writers and teachers as to conclusions and methods, beyond the most evident commonplaces. While this fact necessarily diminishes the authority of "economic science" with the general public, it occasions less embarrassment in educational work than might be anticipated. University examinations are now conducted in large part by the teachers under whom the candidates have been instructed; and where there are "external" examiners, they have usually a wide enough reading and a sufficient realization of what may fairly be expected under particular circumstances to give credit for the intelligent understanding of any treatment of the subject likely to be found in the text-books commonly employed.

Representative Books. Nevertheless, it is due to students to clearly inform them, at the outset, of the absence of any such authority in economic teaching as is conferred by substantial unanimity. There is a good deal to be said for approaching the study of Economics in its present stage much in the same way as Philosophy is now often approached—and, of course, for the same reason—that is, historically; and for substituting for a system the history of systems. This plan has been adopted in the economic departments of the French universities (there attached to the Faculties of Law). Such a programme should include the textual study of important chapters and sections in the writings of the great authors. But if extended courses of this character, replacing the exposition of a particular system, are judged impracticable, the student should at any rate take a rapid general survey of the main outlines of the modern history of economic speculation at a comparatively early stage in his work. Such a survey will usually add very materially to the interest of his studies. He would do well to read for this purpose the admirable little book of L. L. Price, *Political Economy in England* (1891), which is remarkably judicious and wide in its sympathies as well as interestingly written. A more difficult book is that of J. K. Ingram, *History of Political Economy* (1885), which sets the creators of English Political Economy (Adam Smith, Malthus, and Ricardo) and their forerunners, the French "Economists" or "Physiocrats," in their proper relation to the intellectual and social development of Western civilization, and is in parts brilliantly written. The student must, however, allow for a distinct bias, due to the author's acceptance of the social philosophy of Auguste Comte; and he may omit, without serious loss, the accounts of minor authors, which are mostly abstracted from Roscher's *History of Economics in Germany*, as yet untranslated. But since the books of Ingram

and Price were written, the revival of abstract economics under the influence of Jevons has given rise to a considerable literature; the work of Alfred Marshall, attempting a synthesis of the mathematical conception of the subject with the older orthodox English doctrine, has had time to make itself felt; while a fresh departure in Economic Theory has been made in America by J. B. Clark, inspired by "the Austrian school." Some account of these movements may be obtained from selected chapters in the work of the American scholar, L. H. Haney, *History of Economic Thought* (1911), and in the English translation of *A History of Economic Doctrines* by the French scholars, Gide and Rist (1914). This is not the place for an exposition of the contents of Economic Theory in any one of its stages, or as now expounded by any one of the existing schools of thought. The system of Ricardo, the real creator of the orthodox economics of the period 1830–1870, can still best be studied in the *Principles of Political Economy* of John Stuart Mill (1848); though it lies there by the side of much writing of a sociological and humanitarian character with which it has little intellectual affinity, and concessions are made, even in the purely abstract economic argument, which have since been seen to be of wider application than Mill supposed. The additions and modifications in the six subsequent editions issued during Mill's lifetime are shown in the new edition of 1909. An independent treatment of the subject on the lines of Mill, but taking into account subsequent argument and investigation, will be found in the *Principles of Political Economy* by J. Shield Nicholson (3 vols.: 1893, 1897, and 1901 respectively); and in a briefer and more elementary form in the same writer's *Elements of Political Economy* (1903). From America has come the *Principles of Economics* (2 vols., 1911) of F. W. Taussig, which, while not unaffected by later discussion, may similarly be regarded as in the direct line of development from Mill. Taussig resembles his master in the vigorous use of a dignified literary diction. Of the view which makes the doctrine of Value central and determining in the field of Distribution—as "Distribution" is commonly understood by economists—the authoritative presentation is in the *Principles of Economics* by Alfred Marshall (Vol. I, 1890; 5th ed., 1907), and in an abbreviated form in the same writer's *Economics of Industry* (1892). The elaborate and almost exclusive emphasis on Marshall's conception of Analysis, which is not unknown among his pupils, is perhaps partly to be accounted for by the fact that no further volume has hitherto appeared from his pen, dealing with those other topics which Mill and other systematic writers have been wont to include within their body of doctrine. Among recent text-books from this particular point of view may be mentioned the *Outlines of Political Economy* of S. J. Chapman (1911), and the remarkably compact little volume by the same writer, *Political Economy* (1912). A treatment of the subject which is akin to that of Marshall, in that it lays great stress on what are known as *marginal* considerations, though it would seem to reach a different formulation, is that by J. B. Clark in *The Distribution of Wealth* (1902) and in *Essentials of Economic Theory* (1907). This has had a wide influence in America; of the text-books inspired by it the best known is the *Introduction to Economics* of H. R. Seager (1906). The careful perusal of any one of the larger treatises

by Mill, Nicholson, Taussig, Marshall, or Clarke may be regarded as an excellent mental discipline, and will certainly give some assistance in the understanding of economic phenomena. It would hardly be fitting to attempt here any estimate of their relative merits. Nor is this a suitable opportunity to set forth the reasons which have suggested in some quarters a somewhat sceptical attitude toward every attempt, of whatever school, deductive or analytical, to construct, on the basis of some one idea, a completely unified theory of "Distribution."

In the presentation of Economic Theory by the leading writers of the last three decades in Great Britain and America, it will be found that some care is usually taken to explain the necessary qualifications implied in the assumption of Competition, with all that that involves in the transferability of labour and capital. That Economic Theory resting on such assumptions is necessarily "hypothetical" is freely granted. Here the arguments of the German Historical Economists, as set forth with much originality as well as vigour by Cliffe Leslie in *Essays in Political and Moral Philosophy* (1879), as well as the view urged, from a very different side, by Bagehot in *Economic Studies* (1880), which sought to strengthen the claim of abstract economics on the practical man by limiting the area of its application, have not been unheeded. What, however, until quite recently has hardly been recognized with sufficient clearness is that all the forces with which the economist usually deals operate in a social order which rests upon the institution of Property, in the shape in which it exists at any particular epoch, and upon the laws and customs of Inheritance and Contract which are derived from or constitute it. It is only of late that economists have consciously realized the vast significance of all this background to economic striving: its existence has usually been so taken for granted as to be forgotten. It is now coming to be more explicitly and continuously recognized that a doctrine of "Distribution" which seeks to explain individual wages, rents, or profits, or the rates of interest, on the assumption of the existing social order, can only to a limited extent explain the existing "Distribution" of property in any country, in the sense of the gradations of wealth or poverty. The first attempt by an English economist to deal quite explicitly with considerations of this kind is that by E. Cannan, in *Wealth* (1914). An elaborate and most suggestive examination of the law of property and contract in their economic aspects, but with special reference to the United States, is now to be found in R. T. Ely's *Property and Contract* (2 vols., 1914).

Ethics and Economics. Students must be warned not to enter upon their reading in the expectation of being able to discover in Economic Theory either the moral justification or the moral condemnation of existing social conditions. There was a marked bias in the former direction with some of the exponents of Political Economy in the middle decades of last century: to-day there are evident tendencies in certain quarters in precisely the opposite direction. The contentions, based on the doctrine of Population or on the doctrine of the Wage Fund, that industrial conditions, if not positively good, are at least as good as is possible, have been generally abandoned; but much of the modern phraseology of "services" and "marginal product" may easily be misunderstood in the same sense. On the other hand, while the doctrine of

"Surplus Value," which professed to prove both the fact and the extent of the "exploitation" of labour has been given up, it is not difficult to utilize the modern phraseology of "rents" and "quasi-rents" for a similar object. In reality, Economic Theory is merely an exposition of the operation of existing economic forces in a social order constituted as it is at present. Even if true,—which is a large assumption—it conveys no conclusion as to Justice apart from considerations as to human nature, as to the ideals to be aimed at by society, and as to the means of reaching them which are not inherent in the theory itself, but have to be supplied from outside. Those who have been in haste to demonstrate either Justice or Injustice from Economic Theory alone, have usually taken some group of apparently satisfactory or unsatisfactory economic phenomena right out of their setting and context in human society. This is not to say that Political Economy should not be "ethical" and should be morally indifferent; but merely that the standards or criteria must be derived from sources outside "pure" theory.

Economics in Elementary and Secondary Schools. Political Economy is not a suitable subject for elementary schools. It cannot be presented with a reasonable degree of accuracy without explanations and qualifications which teachers are seldom able to supply or children to grasp. But children whose school education is going to terminate at the age of thirteen or fourteen should certainly learn at school, through their reading books or their lessons in geography or history, where the great industries are mainly situated, and whence the necessities and conveniences of life are chiefly obtained. They should also have explained to them, in quite simple terms, the practical working of those public institutions of an economic character which are most likely to affect directly their lives, such as Labour Exchanges and Compulsory Insurance. Almost all students in the upper classes of secondary schools and most students at the universities will better appreciate the nature of Economic Theory if they can first obtain some preliminary knowledge of the external facts of the economic life that surrounds them. Opinions may differ as to how this preliminary knowledge may best be gained—whether by an elementary course of Economic History, in which the earlier stages are dealt with summarily and chiefly with the object of bringing out by contrast the character of modern conditions; or by something in the nature of Descriptive Economics. Either method would serve the purposes in the hands of a competent teacher. Among the books which will be found useful for these purposes are: Bullock, *Introduction to the Study of Economics* (Boston, 1897), with special reference to America; Thurston, *Economics and Industrial History for Secondary Schools* (Chicago, 1899); McKillop and Atkinson, *Economics, Descriptive and Theoretical* (1911); and Ely, Wicker & Price, *Elementary Principles of Economics* (1915). The two last-named books are also among the best brief introductions to recent Economic Theory. A competently-written and interesting book of wider range, suited for more mature readers, is the *Political Economy* (2nd ed., 1901) by the Roman Catholic writer, Devas.

WM. A.

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ECUADOR, EDUCATION IN.—Elementary education, during the colonial epoch, though universally obligatory, was not greatly developed. Spain abandoned it to the archbishops, bishops, and monastic institutions, whose chief pre-occupation was the teaching of religion. A little reading, writing, and some arithmetic were also taught.

Bolívar the Liberator, addressing the first General Congress in 1821, at Circuta, said: "The American people, bowed under the triple yoke of ignorance, tyranny, and vice, have been able to acquire neither knowledge, power, nor virtue . . . Popular education must be the first-born child over which the Congress extends its paternal care. Morality and the light of the intellect are the two poles of a Republic. They are our fundamental needs." He then obtained an Act which stimulated and fostered education, the progress of the arts and sciences, and the study of agriculture, commerce, and manufactures.

In 1830, after the peaceful separation of Ecuador from Colombia, (See COLOMBIA, THE EDUCATIONAL SYSTEM OF), a Directorate General of Studies was established in Quito; Vice-Directorate followed in Azuay and Guayas, and the reorganization of education was taken in hand.

President Rocafuerte, one of the most ardent advocates of education, obtained power from Congress, in 1837, to include in the estimates a grant for the purchase of elementary school books to be gratuitously distributed in public schools and colleges.

The following subjects were taught in colleges for boys: Latin, combined with Spanish, logic, ideology, metaphysics, pure mathematics, general and applied physics, and mixed mathematics.

The education of girls was then ordered. *First year*: Reading, writing, plain sewing, good manners, modesty, and care of the person. *Second year*: arithmetic, line drawing, and needlework were added. *Third year*: Elocution, French, geography, fine sewing, embroidery and floral design. *Fourth year*: The foregoing plus department and domestic economy. Music was taught to boarders.

The teaching hours were thus arranged: pupils rose at 5 a.m., and, between classes and private

study, nine hours a day were occupied; one hour was devoted to religious exercises, and the remainder of the day to meals and relaxation.

Mutual instruction was favourably regarded, and the Director-General of Studies extended the Lancasterian system to the remotest points.

Up to the time of García Moreno's administration, education pursued a laggard course. Moreno energetically fostered it, and with the aid of German savants established a polytechnic school at Quito which was productive of magnificent results; he erected an astronomical observatory and endowed it with excellent instruments; and Italian artists were invited to organize and direct the academies of Fine Art which he also founded.

Schools and colleges increased; and the universities were well attended, though, generally, education was dominated by the Catholic religious orders.

Since Moreno's death, in 1875, public instruction has had its ups and downs; methods have been changed, education has been secularized, and training colleges for both men and women have been opened. Among special institutions may be mentioned, National and Private Arts and Craft schools, and an Institute of Rural Economy, in which the teaching is gratuitous.

Present Day Primary Education. At the present day public state education is secular and free, elementary instruction being compulsory for children over 6 years of age.

The departmental authorities are as follows—

- (i) A Superior Council, composed of the Minister of Public Education; the rector of the University of Quito; a delegate elected by the universities of Guayaquil and Cuenca, and the Faculty of Law at Loja; the rector of the Institute "Mejía," and the Director of Studies for the province of Pichincha.
- (ii) The Minister of Public Education.
- (iii) The Provincial Educational Councils.
- (iv) The Directors of Studies or their delegates.
- (v) The School Visitors.
- (vi) The Rectors of Universities and Colleges.
- (vii) The Administrative Juntas.
- (viii) The Faculties of the Universities.
- (ix) The Parochial Juntas of Inspectors.

1. The Superior Council issues and approves regulations, and authorizes the creation of colleges, training schools, and secondary schools; it appoints rectors of colleges; nominates directors of provincial studies; elects university professors, secondary school teachers; grants degrees; resolves legal difficulties; takes cognizance in the last resort of contentious matters; draws up programmes, and orders methods; grants prizes to authors; opens competitions for text-books, and approve estimates.

2. The Minister of Education, administers his department; he promotes and fosters public libraries, museums, collections of natural history, and other educational institutions; organizes teachers' conferences; prepares education bills for presentation to Congress, etc., etc.

3. In each province there is a council which appoints school visitors, supervises elementary schools, establishes adult evening schools, and controls finance.

4. Directors of Studies are responsible for school management, hygiene, and attendance. They also have authority to compel a country magnate to maintain a school on his estates.

5. School visitors exercise authority over public primary schools; over municipal and private schools, schools of art and commerce, orphanages, etc.

9. A Juntas of Inspectors consists of three responsible householders in each parish, who report monthly on the conduct of the teachers; indicate where schools ought to be established, and give all necessary information to the Director of Studies.

Primary schools are of three classes—Elementary, Intermediate, and Superior. In every parish there is at least one elementary school for boys and one for girls. No school must number more than 300 pupils. In mixed schools the teachers are women. Teachers are of three grades.

Pupils are admitted at any time during the school year. Classes are held daily except on Sundays and Thursday and Saturday afternoons. There are two months holiday after the June examinations in the interior, and the January examinations along the coast.

Secondary Education is divided into Lower, Higher, and Special.

Lower education includes grammar, history, geography, arithmetic, literature, French, English, book-keeping, hygiene, shorthand, and a little astronomy. The course is for three years.

Higher education, which also lasts for three years, comprises mathematics, drawing, history, logic, psychology, ethics, biology, chemistry, physics, geology, languages, and pedagogy.

Having passed through the higher course, the pupil obtains the diploma of Bachelor of Philosophy, which enables him to matriculate at the University or become a secondary schoolmaster.

Training Colleges and Universities. In the Training Colleges the student passes from one class to another, not by examination, but on a certificate granted by the professor. The subjects include moral and civic instruction, theory and practice of teaching, Spanish, mathematics, geography, history, physics, and chemistry.

After four years, examinations are held, both written and oral, with an interval of three weeks between them. The former lasts three hours and deals with subjects drawn by lot some minutes previously. The oral examination lasts ten minutes at least for each subject. After passing this examination, the student proceeds to the fifth course—the theory and practice of education. The final examination is written, oral, and practical. The written lasts three hours; the practical fifteen minutes, at least; and the oral, forty minutes.

University education includes the following faculties—

1. Jurisprudence and Sociology;
2. Medicine, Surgery, and Pharmacy;
3. Applied and Abstract Science;
4. Mathematical, Physical, and Natural Science;
5. Philosophy and Literature.

Rectors of universities and colleges serve for four years. The rector of a college must be a Bachelor of Philosophy, over 30 years of age, of good conduct, and a layman. To be rector of a university, in addition to these qualifications, it is necessary to hold a Doctor's degree in one of the above-mentioned faculties.

Professors on the staff are appointed for ten years; interim professors for four years. Foreign professors are considered to be on the staff.

Candidates for admission to a College must be over 12 years old, and have passed a general examination in the subjects taught in the primary schools. They may be day pupils or boarders.

Students of Law or Medicine must hold a Bachelor's degree; for the other faculties, a special

diploma. Women students are also admitted to the universities.

Education in colleges and universities is gratuitous, an examination fee, not exceeding a dollar, alone being required. The fees for a degree do not exceed twenty dollars, apart from a few other small charges.

Educational establishments which are neither founded nor maintained by the State, come under the category of Free or Unrestricted Instruction, and the State only intervenes in matters of morality, order, scheme of education, and hygiene.

The nation, by granting scholarships and subventions, fosters research in the arts and sciences which may prove useful to the country, both within and without the Republic.

Professors who have served fifteen years have the right to retire on half pay; if twenty-five years, to a pension equal to the salary at the time of their claim. A professor who writes an educational textbook of merit has it counted to him as equivalent to from one to five years' pension, according to its importance.

The chief revenues appropriated to Public Education are: 20 per cent. of the supplementary import duties, the produce of the sale of stamps, ninety unities of the Treasury tax on spirits, the taxes on tobacco, 10 per cent. of the municipal *rents*, the succession duties, and the interest and profits from certain properties.

Training in gymnastics and military exercises is provided in all established centres of education.

Ecuador now stands fourth among the republics of South America in respect to school attendance, and illiteracy is rapidly dying out. C. A. B.

EDGE HILL TRAINING COLLEGE, LIVERPOOL.

—Was opened, in 1884, as the result of private enterprise, and is situated near the University. Forty students were admitted in January, 1885, under Miss Yelf, who was Principal until 1890. Extensions were made in 1891, and again in 1903, providing a gymnasium, additional classrooms, laboratories, and an art room. The College was undenominational. University courses were commenced in 1894, and the College was afterwards affiliated with Victoria University; many students graduate in Liverpool University, staying a third year for that purpose. Some students visit the Continent to complete their training. Council schools in Liverpool are visited for practice in teaching.

EDGEWORTHS AND THEIR CIRCLE, THE.—

Richard Lovell Edgeworth (1744–1817), his daughter Maria (1767–1849), and their circle (including Erasmus Darwin (1731–1802), Thomas Day (1748–1789), and his biographer, James Keir, Dr. Small of Birmingham, Mrs. Barbauld (1743–1825), James Watt, the inventor and Josiah Wedgwood were identified with the movement for the practical amelioration of society on lines of scientific and humanitarian progress. Edgeworth was solicitous for the economic development of Ireland. Thomas Day advocated slave-emancipation and reform of the franchise; while Mrs. Barbauld and her brother, Dr. Aiken, were friends of John Howard, the philanthropist.

The Edgeworth group did valuable constructive work for society precisely because it united scientific and practical interests with a broad humanitarian outlook. Practical, without being narrowly

utilitarian, it anticipated educationally the best in Herbert Spencer, while free from his bias.

Richard Edgeworth and Thomas Day were a link between Rousseau and later tendencies in Great Britain and the Continent, towards a more natural and more directly effective type of education.

Richard Edgeworth. Educated at Trinity College, Dublin and Corpus Christi, Oxford, an Irish land-owner, a publicist, keenly interested in the improvements of Irish agriculture, and in useful inventions (e.g. telegraph connection and a land-measuring machine), a member of the last Irish parliament at Dublin before the Union was prevailed upon by Dr. Erasmus Darwin of Lichfield, author of the *Botanic Garden*, to write on educational subjects. Darwin himself corresponded with Rousseau, and published, in 1797, *A Plan for the Conduct of Female Education*; modern in its insistence on the cultivation of a good physique, calling for special attention to fresh air and exercise and reasonable dress, but less progressive than the Edgeworths in its tendency to discount initiative and originality in girls.

The first phase of Edgeworth's educational speculations and practice was associated with the tenets of Rousseau, of whom he and Thomas Day were ardent disciples and practical exponents: both trying to carry out Rousseau's system of "Natural" education, the former with his eldest son and the latter with his adopted children, whom he tried to form on the model of Rousseau's "Sophie."

The second and more valuable phase was associated with Edgeworth's daughter, Maria, and in it Edgeworth broke away from the letter of Rousseau's teaching, and struck out lines of investigation and experiment of his own, laying the foundation of modern observational and experimental child-study.

Edgeworth recognized in the case of his eldest son the fallacies of Rousseau's system, and proceeded to make systematic observations on his other children, with a view to better methods. He and his wife began to keep records of such observations. In 1791 Maria also began to make systematic notes, and lays great stress on this side of her father's work, stating that, while assertions and theories abounded, facts and experiments were wanting. "I claim for my father the merit of having been the first to recommend, both by example and precept, what Bacon would call the experimental method in education." Certainly, a study of Edgeworth's writings shows that he progressively corrected his own views; compare the *Memoirs* and *Professional Education* with the earlier *Practical Education*.

In the home education of the Edgeworth children, the strain of forced, uncongenial labour was lightened—short lessons, an appeal to interest, varied occupations (handwork, gardening, experimental science); method was adapted to the individuality of the pupil, and the whole of education related to actual life and the natural and human surroundings of the child. Edgeworth's own scientific and mechanical interests played considerable part in the development of the children's intelligence.

Literary Work. The literary outcome of the Edgeworths' interest in education was *Practical Education* (1798), translated by Pictet of Geneva, whose translation was published in Paris and Geneva (1800); and the *Memoirs* (both works being the joint production of father and daughter); and also a number of children's books, beginning with Edgeworth's *Harry and Lucy*, incorporated later in Maria's *Early Lessons*, with valuable prefaces (e.g. the *Address to Mothers*, signed R. L. E.).

A notable feature of the Edgeworth circle was its important contribution to children's literature, which it practically created in England. Thomas Day produced the famous *Sandford and Merton* (1791), Rousseau-like in its advocacy of the simple life and of learning through self-activity. An outstanding author for children was the school-mistress, Mrs. Barbauld, brought into relation with the Edgeworths through their educational writings. It was suggested to her that she should open a college for young ladies, but she declined, feeling the want of solid foundation in girls' early education, and distrustful of her own qualifications. Devoting herself to the interests of young children, she wrote *Lessons for Children*; Prose Hymns; and, in conjunction with her brother, Dr. Aikin, *Evenings at Home*.

All these publications were educational in their appeal to children's intelligence, especially in connection with the facts of common life and the simpler aspects of natural science, both in stories and nature talks. On this side the books were essentially modern. In their continual moral insistence they belonged more particularly to their age, a vital part of the current protest against eighteenth century irreligion, artificiality and callous inhumanity. Though writing mainly about private education, Edgeworth had great confidence in organized public education as a social leverage. As regards Ireland in particular he built great hopes on the possibilities of the Irish people, "A good government may make this a great country, because the raw material is good and simple" (letter to Dr. Darwin, 1794). In the Irish Parliament, he obtained leave to bring in a bill for the improvement of the education of the people of Ireland. "In the shock of contending parties . . . I found an opportunity of laying the foundation of a system of education by which the wretched poor of this country may in time be rendered less savage" (to Darwin, 1799). When the Irish parliament ceased to exist, Edgeworth became a member of the Irish Board of Education.

As a whole, the Edgeworth circle stood for progress through liberty and individuality.

A. WATSON.

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